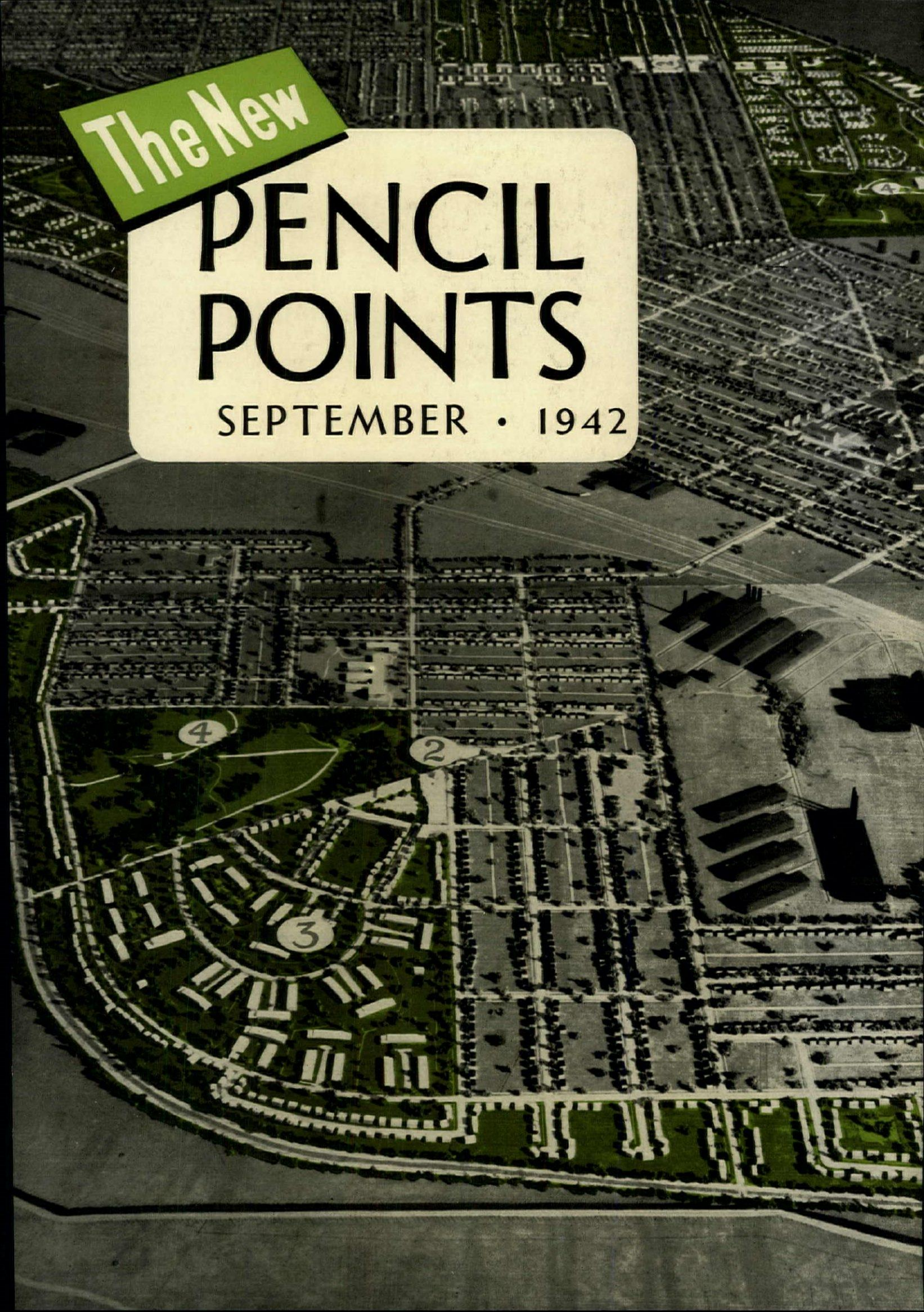

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ARE PLANNERS PREPARED

Apparently stimulated by the widespread oral and printed public discussion by planners of the subject of Urban Rehabilitation as a great post-war activity, Professor Emeritus Charles W. Killam of Harvard University School of Architecture, representing the point-of-view of hard-headed conservatism, was moved to send us, late in June, a challenging article in which he has raised many questions as to the validity of current theories. In search of answers to Professor Killam's questions we sent copies of his article to a number of competent authorities, asking them to shed light if possible on some of the points at issue. We present the results hereafter, as a sort of symposium which may help to stimulate more intensive thought about the job that will increasingly face all technical planners, including architects. The contributors to the discussion are as follows: **Frederick J. Adams,** Associate Professor of City Planning, in charge of the Course in City Planning and Housing at M.I.T., Cambridge; **Charles S. Ascher,** Regional Representative of the National Housing Agency, New York, and former Consultant for the National Resources Planning Board; **Harold S. Buttenheim,** Editor, "The American City," New York; **Carl Feiss,** Assistant Professor of Architecture at Columbia University, recently appointed Director of the City Planning Commission of Denver, Colorado; **Arthur C. Holden,** Chairman, Land Utilization Committee of New York Building Congress; **Charles T. Stewart,** Director of The Urban Land Institute, Washington; **Robert B. Mitchell,** Chief, Urban Section, National Resources Planning Board, Washington; **Ralph Walker,** Member of Mayor's Committee on City Planning, New York; **Walter R. B. Willcox,** Architect and Single-tax advocate, Eugene, Oregon.

The authorship of the comments printed on the following pages as far as possible in juxtaposition to the pertinent text, is identified in each case. Though the authorities seem to differ from each other on some details, due to divergent economic and social philosophies, they seem to agree that there is urgent need for intelligent study by many able minds if the post-war world is to live up to its promise.



Professor Killam establishes his background and general point of view in the following autobiographical note: "Born 1871. Twenty-one years in office of Peabody & Stearns, twenty-nine years in School of Architecture, Harvard University, part of the time as Chairman of the School of Architecture and Acting Dean of the Faculty of Architecture. Now emeritus. Lecturer in the Smith College Graduate School of Architecture and Landscape Architecture since retirement from Harvard. Teaching, particularly in construction, accompanied by consulting practice. Author of notes on architectural construction. Some A.I.A. committee work. Former Chairman Cambridge Planning Board and Cambridge Housing Authority. Some experience in drafting building codes. Interested in problems of municipal government for many years and latterly in post-war economics problems having to do with the building industry, this study leading to doubts as to the expediency, feasibility and justice of **WPA, USHA** and continuous gigantic spending advocated by **Roosevelt, Dr. Townsend, Wallace, Hopkins, Hansen, Greer, National Resources Planning Board,** and others to free the whole world fom the fear of want."

1 Questions raised by Professor Killam are pertinent but are old timers. Most of them have been considered at National Planning Conferences at one time or another during the past thirty years, difference being that those raising the questions usually had a solution to offer—even if it did not meet with general agreement! ADAMS

2 Mr. Killam, in a mildly petulant and generally sarcastic tone, places before us some pertinent questions on present-day theories of Community Planning, some of which he answers himself and some of which have not yet been answered by anyone. His title, "Planners Unprepared for Urban Rebuilding," sounds not unlike a newspaper comment after Pearl Harbor. Planners can only have the satisfaction of knowing that no one else is prepared for urban rebuilding and that no one has had the temerity to reach a final decision on what constitutes a good city plan. FEISS

WHAT part can the building industry perform in post-war reconstruction? Anything which would increase building construction would have a great influence upon the employment and production situation because of the very wide range of the materials which are needed in the industry. (1) When peace comes there will be many powerful groups in Washington clamoring for Federal billions for their particular interests, some of them ready and anxious to spend public money to increase their profits and others claiming an altruistic desire to raise the living standards of the whole world and to free the world from fear of want, also by use of public money. Advisers of the Administration look upon a continuation of gigantic borrowing with equanimity if not with enthusiasm. (2) Rebuilding of cities is advocated by many because of great loss in values in general due to decentralization and the growing decay resulting in blighted districts

TO REBUILD OUR CITIES?

and slums. Before any large building program is started, however, we should consider whether we have developed a well-tested program for rebuilding. **The important fact is that the planning profession has not yet decided what constitutes a good city plan.** (3) We shall, therefore, be handicapped when we join the post-war crowd at Washington in clamoring for Federal expenditures for industry. (4) Other groups will be powerful and will have much more definite programs and, therefore, a better chance. We need to do a good deal more than merely to lobby now for an appropriation to pay us for drawings for Public Works Reserve projects.

The present discussion is particularly concerned with the rebuilding of medium and large size cities, not with cities of a few thousands. It is also assumed that cities are not to be deserted and that no nation-wide analysis now is going to change the location or essential functioning of long established cities. (5) It is too late now to look over our harbors, rivers, and railroad systems and pick out new locations for cities and then to specify the kind of activities which each of these cities should encourage. A condition, not a theory confronts us.

Numerous writers have told us that our troubles are due in large part to unplanned growth. They urge us to rebuild only in accord with master plans, national, regional, and municipal, and to develop cities with properly balanced land use, arranged in neighborhoods, more light and air, less traffic congestion and more amenities. As far as can be discovered, however, nobody has been definite enough to tell us just what this means, what kind of people, what kind of occupancies, what kind of buildings, and what kind of traffic ways they would actually advise in different parts of a city. Idealistic generalities, which do not crystallize and which disregard national, state, and municipal costs, do not help much. **There must be some basic principles which can be accepted and these should be published as definitely and concisely as possible.** (6) We need to know what principles are applicable in general to all cities so that local study can be concentrated upon local details.

3 By and large the planning profession has a pretty clear idea of what constitutes a good city plan. Trouble is to get public support to planning proposals and to financial backing necessary for carrying them out. Municipalities are not in a position to finance major operations on blighted districts, yet Professor Killam would disavow any solution involving Federal or state subsidy. What is *his* solution to the economic problems involved? ADAMS

Perhaps some of the inquiries probe for answers that are available. At least one plan for urban redevelopment (The Urban Land Institute proposal) contains a statement in precise language of just what it means by a good city plan. The FHA "Handbook" is prefaced by a full description of various components of a plan. STEWART

4 It should be noted that "our industry" is the way of life of half the population. Cynicism of "feet in the trough" attitude is not a fair picture. ASCHER

5 Mr. Killam's keen comments are hard to argue with. Most of what he says is obviously true. The expression of his personal prejudices at various points may be overlooked because they may throw us off the beam. Of course, planners can always magnify disagreements about a few details. For instance, "no nation-wide analysis now is going to change the location or essential functioning of long established cities," but no doubt Mr. Killam knows that economic forces are doing a pretty fair job of it up in his part of the country, as well as elsewhere. MITCHELL

The war is making this analysis for us ! ! ASCHER

6 Perhaps we need not entirely flounder in seeking basic planning principles. After all, there are certain standards, capable of rather wide application, that are known and used. We know, for example, that major thoroughfares which must carry a considerable volume of automobile traffic should be planned apart from streets intended for other types of traffic; but they should be free of frequent intersections; that the layout in most cases should be influenced more by land contour than by the straight edge. This principle is in use. We simply need to apply it more widely in future planning.

In the plotting of lots, we have found that a shape approaching the square more closely than the extreme oblong makes for better placement of dwelling structures and better utility of the land. Again, this is an established principle which can be grasped and used more extensively. We know that street surface designed for moving traffic does not make as suitable storage space for stationary vehicles as off-street terminals. We have put this principle into use and should expect to continue to do so. Population figures warn against overconcentration of land use in skyscrapers, and there is no reason to think that the warning will be ignored. Many other examples might be given. STEWART

See "Better Cities," by NRPB. Studies are under way of possible change in local taxation, treatment of tax-reverted lands, federal grants, their terms and conditions. ASCHER

We have many reports covering existing conditions in particular cities or particular neighborhoods. We have developed techniques for gathering and publishing the results of such surveys. As to methods of carrying out rebuilding programs, a few states have passed statutes to help private enterprise to rebuild on an adequate scale and other states are considering legislation. (7) Has anybody done anything more than reports? No appropriating committee is ever going to read a hundred local reports and look at a thousand spot maps. "Our Cities," a report of the Urbanism Committee of the National Resources Planning Board in 1937, states that local urban planning needs fundamental over-all guidance (8) based on planning and research by government on higher levels. "Housing—The Continuing Problem," issued by the National Resources Planning Board in 1940, states that there is yet little agreement as to what pattern of residential development combines in the best proportions attractiveness and livability with economy of management and public utility servicing. The "National Resources Development Report for 1942" of the National Resources Planning Board states: "Before we undertake large-scale rebuilding, certain basic policies must be established nationally and regionally: directives must be given broadly so that the city's officials and its citizens can see in the large their place in the state, the region, the Nation. We must have, first, some picture of the most desirable distribution of the population nationally." **Is it not still more important and practically useful to establish basic principles as to the most desirable distribution in a region, a state, or a city?** It is easy to deny this and to say that each metropolitan district, each city and each neighborhood is a separate and distinct problem on which we can get no help from established basic principles or the experience of other cities. In all other activities, however political, business, professional, or cultural—we try to establish tested basic principles. (9)

We must have some agreement before we can expect the Federal government to spend billions on rebuilding cities and we must be ready with an agreed upon program at the end of the war. We must have something shorter and more definite than reports and spot maps, something more than assertions of our ability to lead. (10)

7 Of doubtful effectiveness. ASCHER

8 The type of "over-all" guidance that is needed is not the kind that we have been getting. The national planning agencies can suggest and stimulate and summarize. They cannot and should not specify. Standards should be set locally and decisions should be made in the locality. HOLDEN

9 Such "tested basic principles" always turn out to be such broad directives that they do not provide answer for local problems—or else they turn out to be such rigid formulas that they cramp desirable local solutions. ASCHER

10 It is easy to see that Mr. Killam would not be satisfied with the decision which planners would make at the present time. It is curious that he believes that the profession must make the final decision. It should be obvious that planners today who would dare to state what the final criteria of city planning should be could only be considered as suffering from a Messianic complex. FEISS

The National Association of Real Estate Boards estimates there are 40 billion dollars' worth of blighted urban areas. (11) Some writers urge that, after serious amendments of laws, parts of these blighted areas should be acquired by local governmental units with money advanced by the Federal government; the areas then to be used for public purposes or be leased to private developers. Familiarity with some of these near-in blighted and slum areas raises doubts as to the practicability of turning any significant part of these areas into public uses or open spaces. Open spaces are more needed in residential districts than in or near business areas. (12) If such areas are to be built up by private developers what sort of activities and what sort of buildings should be provided for? Do we need to provide low-rent housing on near-in land, costing $2.00 and up a square foot, because it is assumed that low-wage mid-town employees must walk to work? (13)

HOW MANY WALK?

As a matter of fact, how many do walk to their work? (14) If they insist that they shall be housed within walking distance of their work in business centers they must continue to live in sub-standard buildings on this high-value land. They have no right (15) to expect to live on near-in, high-value land in new 3-story apartments with 25 percent coverage and with playgrounds, neighborhood social rooms, wading pools and other amenities which self-supporting apartment houses on land further out cannot afford. Subsidized housing on the USHA basis is no solution for these areas. (16) Hansen and Greer, in "Urban Redevelopment and Housing," published by Urban Land Institute, December, 1941, state that at least 14 or 15 million town and city families and the majority of all farm families are unable to afford for themselves dwellings as costly as the USHA program has provided, and in one way or another these families will have to pay a large part of the cost of better housing for a small percentage near the bottom of the income scale than they can afford for themselves. The Government cannot keep that up. If this near-in land is not thus to be allocated to the low-wage, walk-to-work population how should it be developed?

A boarding house district is generally spoken of disrespectfully as a blighted dis-

11 The only figure I have seen as "assessed valuation" of slums is 40 billion. Philip Cornich, leading expert, contests this figure as grossly inflated. ASCHER

12 "Open spaces are more needed in residential than in or near business districts." Has Charles Killam ever heard of automobile parking problems and the congestion of traffic on streets? Has he ever considered the future of the helicopter? Has he ever witnessed the miserable, noon-hour, street-corner, lamppost hanger? The need for space in the urban business center is a very urgent one and if our neurotic modern machine civilization is to be solved, the senseless desert of brick and stone which we call our urban centers must be opened up and a large bit of the underlying land with its natural verdure be uncovered. The question is not what rehabilitation might cost but what the present desert has cost in inefficiency and constant waste. How can we make the growing ruin livable? Charles Killam would have us think that the present urban centers are justified economically? So!! WALKER

13 Also: "Do we need to provide low-rent housing on near-in land, costing $2.00 and up a square foot . . . . ?" Of course, in very few cities do you find this near-in land so expensive; but couple this with the later argument for high-density apartment building. I feel sure Mr. Killam has already estimated how much population could be housed in high densities in the present blighted areas of his home metropolis (without subsidy) and where this population might come from. Similar calculations by others have convinced the calculators they must not take the $2.00 and up prices too seriously *in any large scale rebuilding over a reasonably long period of time.* MITCHELL

Land values must not be determinant for land use in areas ripe for redevelopment. If land is worth $2.00 a square foot it must have some higher economic use than low-rent housing. On the other hand, if the latter is its most appropriate use, economically as well as socially, then its real value per square foot cannot be anywhere near $2.00. ADAMS

14 Astonishingly, a Gallup poll in December, 1941, showed that under 50% of auto owners used them to work; about 20% used mass transportation, and over 30% walked to work! ASCHER

"If they insist that they shall be housed within walking distance of business centers they must continue to live in substandard buildings on this high-valued land." In mediaeval times they would argue, "If a rat ate a sacred wafer would he be holy?" The land is now used for substandard housing because it cannot be used for any other economic need, so one might well question, "What makes the high value?" This would seem to be a vicious circle. The high value is only sustained by a hope of speculative increment, but it is also evident that in large parts of blighted areas this speculative increment has already been skinned off, leaving values caught and held by city assessments and as yet not written off bad loans. The real lack of realism is in Charles Killam's remarks because he cannot be aware of the doubtful fact that these blighted areas may never again have sufficient customers to maintain these fictitious high values. These unrealistic high land values are the nigger in the urban woodpile and are one of the main causes why all kinds of tenants may not have the amenities of good living, which Charles Killam refuses to low income workers. Charles Killam talks of costs of progress without considering the costs of present waste—the slum and blighted area at one time paid their way; made a profit in fact.

A clothing salesman was objecting to the high taxes saying, "It is always the same when they get a goose that lays the golden eggs. What do they do with it? They milk it, they milk it." To keep on with the mixed metaphor, the milked eggshells are the high values in blighted lands. WALKER

15 It's the community's right, not their right. ASCHER

16 There is no doubt that we have gone far astray in our ideas of the use of subsidies. Subsidies should be considered as temporary aids to establish logical and economic relationships. Subsidies should be used to correct the faults that prevail in real estate and construction. It doesn't correct these faults to do something so illogical as to use the best and most convenient land for homes for people who can only pay subnormal rents. HOLDEN

17 Private interests cannot operate unless at least a modest profit is assured. Except in a few instances the greater proportion of our blighted urban areas cannot be developed for a higher economic use than their present one. It therefore would seem unlikely that any self-liquidating program can be developed for extensive blighted areas, especially where land assessments are high. Toll-bridges, tunnels and transit lines can charge what the traffic will bear, but annual charges on landlords and tenants in blighted urban areas are already so high in relation to value received that both residents and commercial establishments are being driven away from these districts altogether. Lodgers do not normally pay any higher rent per room than low-wage workers, so this is no solution which would eliminate need for subsidy. ADAMS

18 On the subject of neighborhoods, let me toss back another question: Admitting that for some groups of the population the neighborhood is not a social fact, could it be a useful municipal-service and political unit? Can citizen-responsibility be more in scale with the individual in the neighborhood than in the metropolis? MITCHELL

Mr. Killam rightly criticizes the National Resources Planning Board for assuming that one neighborhood pattern should be followed even if it were possible to determine an ideal pattern. The truth probably lies between Professor Killam's statement and that of the National Resources Planning Board. There is room for many kinds of organization and grouping. City-wide as well as neighborhood relationships must be given an outlet. HOLDEN

19 Mr. Killam asks for many studies which he believes should be made to pin the "idealist" to the mast. Mr. Killam has studied many of the reports of the National Resources Planning Board. He disagrees with many of the findings in them. However, it should be pretty clear to him, if he has read the reports as thoroughly as he indicates, that the planners are worried about the very things that he is worried about; that they have not yet been able to find answers but that they have been trying very hard to find them.

Why Mr. Killam fears the idealist is puzzling. Certainly there is very little evidence that the practical business man, including the architect, has found the answer. In fact all the evidence is to the contrary if we appraise our communities for what they really are. I, for one, believe that we need more idealism and that our plans have little validity unless they are aimed at objectives which may at the present moment be well out of sight but which are far better than anything which our business men and our so-called solid citizens have yet been able to accomplish. FEISS

20 This apartment project contains 30,000 people, in itself a small city! ASCHER

21 What happens when "hard-headed realists" impute to idealists assumptions which aren't there? ASCHER

22 The authors of this NRPB report recognize that no absolute proof is possible of the hypothesis that stratification of social or economic groups is sociologically unwise or in support of their belief that the average citizen benefits by participation in associations representing neighborhood interests. However, in accepting the consensus of urban sociologists on these questions the authors surely are on somewhat safer ground than they would be if they relied entirely on individual opinion. In fact the question might be raised as to whether it is the NRPB or Professor Killam who is "challenging the habits of the people." ADAMS

Only a twenty-page pamphlet. ASCHER

Look at Georgetown, Washington, where Asst. Sec'y of State lives in same block with Negroes. Look at Greenwich Village, N. Y. ASCHER

23 There won't be any illiterates after the war. ASCHER

trict. There are millions of lodgers to be accommodated. Where? (17)

The proposal for neighborhood units might be considered an example of definite planning. This means the division of a city into neighborhoods, each large enough to support an elementary school and each delimited to some extent by important traffic ways, railroads, water, parks, or some other physical element if practicable. The theory is that most people want to take part in neighborhood activities and that such activities are socially valuable and important. (18) In a city of 100,000 people there might be, say, 20 elementary schools each the nucleus of a neighborhood. Some advocates of the neighborhood scheme have argued that each neighborhood should be limited to people of the same social and economic character but the "National Resources Development Report for 1942" of the National Resources Planning Board urges the importance of rebuilding so as to develop neighborhoods.

FREE MINGLING

It also states: "One other principle should serve as a guiding idea in our large-scale rebuilding: we must avoid a pattern of stratification, whether by incomes, occupations or otherwise, which will produce self-contained colonies either of manual laborers or intellectuals or enterprisers, which will perpetuate areas marked as the exclusive preserve of persons of one language group or national origin. The challenge of our city rebuilders is to provide the opportunity for free mingling of all groups in our democratic society. . . ." (19) The report criticizes an apartment project which provides no room of any sort in which groups of residents can meet to discuss common problems. (20) As usual when idealists follow their hobbies regardless, (21) the report does not prove that people dislike stratification and it does not describe what kind of buildings in what kind of locations such a mixture of people would require. Nor does the report (22) prove more than a relatively small number of people want to get together for neighborhood discussions, nor does it explain why school buildings cannot be used for the purpose. Any proposal to house the well-to-do in the same neighborhood with the poor, the illiterate, (23) or immigrants, is an example of wishful thinking about the control of somebody else, but peo-

ple will still insist upon living and associating with their own kind. Much is made of the fact that some of the occupants of subsidized housing projects have formed neighborhood clubs but it does not follow that the more independent members of the population are equally anxious to club together. (24) It is a question whether neighborhood associations, with their tendency to work selfishly for the interests of their own districts, are as useful to the city as the large number of city-wide organizations in which people in all walks of life can find many different ways for social companionship and for social, civic, and religious activities. And many people in all strata of society are not interested in clubs anyway. (25) **The building industry has enough challenges to face without challenging the habits of the people.** (26)

The very common statement that a great majority of the people prefer to own their own homes and to live in a single house should be checked by a Gallup poll (27) of urban dwellers and should also be checked against the income and job security conditions of a majority of the population. People are likely to distribute themselves on the basis of the desires and possibility thus shown anyway. (28) There are a very large number of people who prefer a car to a house, who hate to work in a garden and who want to reach their work, their shopping centers and their amusements with a minimum of time and effort. Millions of them are unmarried or, if married, have no children or have children who have grown up. They do not need open spaces or playgrounds. (29) A reasonable development of near-in blighted or slum districts would seem to be apartment houses for this part of the population. But in large cities such development of high-value land, even for well-to-do people, cannot be on the extravagant basis of height and coverage of the USHA projects. (30) Opposition to apartment house development in general is non-realistic. (31)

LOCATING INDUSTRIES

Another very important question which is unsettled relates to the best location for industry. Should industries and their employees be located in the city, just outside the city or in rural areas? The "National Resources Development Report for 1942" of the National Resources Planning Board

24 Realistic proponents of the neighborhood unit idea in city planning probably do not advance their ideas to permit the formation of "neighborhood clubs" or community activities that function austerely at the rap of a gavel. I suspect that the real motive is to permit neighborhood arrangement and composition to foster spontaneous community activity that would not need to resort to such artificial trappings of neighborhood identity. They probably have in mind such neighborhood activity as saying "Good Morning" to one's neighbor, which somehow is not possible when people are stored at intense densities in areas of formless urban mass. STEWART

When their physical environment permits, evidence is strong that they want to get together for discussions. See "Radburn, A Way of Life." I thought the town meeting was an old New England tradition. ASCHER

25 Spoken like a true Cambridge individualist! I sometimes believe that more energy goes into voluntary activity in this country than into paid work — the church groups, fraternal orders, lodges, veteran's groups, bridge clubs, civic associations, etc. ASCHER

26 Unless the building industry recognizes the true desires of the people, it will continue to provide unsatisfactory rabbit hutches, instead of democratic communities. ASCHER

27 Professor Killam's suggestion for a Gallup Poll to determine whether or not people really prefer to live in single family homes seems unnecessary. In his realism he does not favor attempts to change living habits, and American living habits favor the single family home. A recent report of the Chicago Planning Commission points out that New York and Chicago are the only self-contained American cities in which a majority of the people are accommodated in housing other than single family homes. STEWART

This is now being done in sample survey by Gallup for Bureau of Urban Research at Princeton. ASCHER

28 We must recognize that people do have varied tastes. Because of the large number of people who would sacrifice much to have a garden we should not assume that there are not a great many who wouldn't prefer the compact city-type apartment with its teeming life. HOLDEN

29 Of course, they do — but with *adult* recreation facilities. ASCHER

30 Hansen and NRPB agree. It's the *imputation* of high value that must be done away with. USHA by statute was a prisoner of this imputation. ASCHER

31 Mr. Killam throughout his paper confuses two issues which have not been settled by the sociologist, the economist, the public administrator, the city planner, the architect, or anyone else. These issues are centered around, first, a definition of what planning really is, and second, a definition of what are our proper standards of living. There is a third issue which could be included also. This is the issue of democratic action as it relates to planning. Rexford Tugwell, several years ago in a very interesting document, stated that he believed planning could be considered a fourth power. FEISS

Here is one generality which if followed would improve urban life. "Tax neglect and subsidize progress."

Another. Cut all ideas of future growth to double present populations; then plan business and residential densities on that basis. There is sufficient land for decent living. The cost of the spread out of population can be no more than the cost of blight. The New York Zoning ordinance permits, within present possible envelopes, in its five boroughs, an estimated 330 millions of day and night population. Who is crazy, the planner who objects that this is nonsense or the realtor who hopes for an opportunist commission on a few but sizeable sales? Who is finally the waster of the communities' assets? The trouble with planning is not with the ideals of planners but in the compromises which the unthinking or the speculator persist in creating as obstacles. WALKER

32 A problem of the future will be the assembly and rearrangement of near-in land for industrial purposes. Efficiency need not be expensive. It ought to be possible to translate present wastes into better space, better arrangements, and lower rents. HOLDEN

33 We have little reason for expecting industries to come back to the congestion and higher costs of urban centers, but it does not follow that workers need to live at inconvenient distances, even if protection from aerial bombardment is given full consideration. ADAMS

NRPB has report on Industrial Location in preparation. ASCHER

34 The old demand for salability and sovereignty of use for individual properties has required wasteful street patterns and wasteful utility layouts. We will not be able to revise our street pattern without a change of attitude on the part of lawyers as to the advantages or disadvantages of restrictive covenants, private rights of way, etc., and the dependability of individual properties upon the maintenance of a workable neighborhood pattern. HOLDEN

The question raised as to the economic feasibility of a thinly scattered city is a timely one. Unless we are to proceed in complete innocence of municipal finance, our replanning will undoubtedly face the task of providing a sensible degree of civic compactness without congestion. With modern street layouts and lot arrangements there need be no dilemma in this. STEWART

I am much impressed by Hansen's point that the cost of municipal services is not the full calculus, by itself. A full-employment economy must afford its workers access to as wide a choice of jobs as possible. To achieve this we may have to live together in larger groups, requiring more municipal services. But a home owner (a tenant) who has fifty weeks work a year would mind $100 taxes for local services less than a half-idle worker would mind $50. ASCHER

asks: "Would it profit a town famous as a center of learning or as a haven for health seekers to attract manufacturing, if it thereby lose its soul? Is the indiscriminate attraction of industry—any industry—by any means—tax exemption and bonuses—wise?" (32) In this connection, the thoughtless boosters who think every addition of industries or workers to a city is an unmixed advantage should study the "Report on the Income and Cost Survey of the City of Boston, 1935," and other similar surveys. The "National Resources Development Report for 1942" of the National Resources Planning Board states: "Prior to the war, manufacturing was tending to become increasingly suburbanized. This trend has continued, for even under emergency conditions, the aim of many private concerns in locating a plant has still been to get close enough to a city to tap its metropolitan labor market and share its transportation facilities and privileges, yet remain far enough on the outskirts to have cheap land and lower taxes. The pre-war trends toward the suburbanization of manufacturing and the industrialization of certain new areas were accompanied by the establishment of industrial plants here and there in places apart from the main centers of industrial growth. To some degree this tendency toward dispersion has been continued during the emergency period." The discussion of industrial towns in "Urban Planning and Land Policies," Vol. 2 of the Supplementary Report of the Urbanism Committee of the National Resources Planning Board, should be brought up to date and amplified to include facts as to the advantages and disadvantages of decentralization of industry, remembering always that there are three elements to be considered, the employers, the employees, and the municipalities. **Must workers in industries live at inconvenient distances from the plants to reduce danger of bombs in residential districts in time of war or shall we assume peace to be the normal condition?** (33)

MUNICIPAL COSTS

We need more information as to comparative costs of municipal services to compact and to scattered developments. The advocates of more open spaces, lower buildings, and low percentage of land coverage in zoning codes should tell us the comparative costs

of compact and sparse development, not only to the municipality but to the people who must travel longer or shorter distances to work, shopping centers, and amusements. (34)

Can we reduce municipal expenses by abandoning some of the existing streets, leaving access to some houses only by paths as in many recent housing projects or would such street closings make it impracticable to deliver fuel to individually owned houses? Could such abandoned streets be turned into playgrounds for small children? (35)

Should we work for laws which will allow a municipality to find the final cost of a land taking before committing itself?

EFFECT OF TAXATION

The effect of the incidence of taxation on real estate has not been thoroughly investigated as to its effect on city planning and rebuilding. (36) For instance, how have graded taxes on land and improvements worked? Some cities have a single tax on land only and others have a smaller tax on improvements than on land, Pittsburgh, for instance, at half as much on improvements as on land. Such a tax shifts a large part of the tax burden to vacant land. Does it tend to lower land **prices** but still maintain land **values** because of the kind of development which it encourages? (37) Does it encourage a continuously graded intensity of land coverage from skyscrapers in the business center to single houses in the outskirts? What kind of buildings are built in different zones in cities where improvements are partially or wholly exempt from taxation as in many cities in Australia, New Zealand, South Africa, and a few in western Canada? Have such taxes led to congestion in business districts in order to make the improvements pay the high taxes on the land? How have such taxes affected the values of near-in blighted or slum districts? Have they led to a compact development of urban land from the center outward thus leaving no vacant lots by which streets and other services must be wastefully carried or have they led to the erection of cheap one-story taxpayer developments on lots which would otherwise have been left vacant? How have they affected single house building for the well-to-do? For the low-income group? (38) **These and other questions cannot be satisfactorily**

35 Mr. Killam asks for many facts and figures. He does not break them down into their several component parts and does not fairly indicate what in the collection of these figures belongs to the city planner, what belongs to the social scientist, what is the duty of the economist, or what is the proper concern of any other technician interested in urban physical improvement or the improvement of environment as a whole. FEISS

36 I certainly agree that the whole property tax system must be revised, although I do not believe that this is a responsibility of the planning profession. It seems to me that Professor Killam has given the latter enough to do in the preparation and carrying out of plans for urban redevelopment. ADAMS

The real estate tax ought to be subjected to a comprehensive study. There are times when public purpose is served by taxing land and exempting improvements. There are other times and places where it would better serve public purpose to tax improvements and minimize the tax on land. HOLDEN

37 In his series of questions on real estate taxation, Mr. Killam is probing a field where the mind of architect or planner has too seldom ranged. This field needs exploring; but to the extent that the study should be based on practical experience, its area lies mostly outside the United States.

With a few exceptions, such as some California irrigation districts and some tiny "single-tax enclaves" elsewhere, we have no communities in the United States where local property taxes are levied on land values only. The "graded tax" of Pittsburgh and Scranton is an important venture in the right direction, but the Pennsylvania Legislature has not yet seen fit to allow its cities to go far enough in this experiment to prove its real possibilities.

No system of taxation, no matter how rational, would in itself stop ignorant or anti-social developers from land-overcrowding: that problem must be solved by better planning and zoning. But if—within limits thus prescribed—we want to encourage new and better construction, it seems obvious that a reduction in the tax rate on improvements and an increase in the rate on site values would have important social and economic benefits. New construction would be encouraged, and desirable sites more readily obtainable. BUTTENHEIM

38 One could go on with other points but more important is the comment that these questions need earnest thought by both local and national groups. Many others could be added. These questions that start so bravely to limit themselves to the physical, immediately pop off into the less tangible economic and social fields and I guess architects will have to follow them there.

Some of us in government are working with these questions all the time and feel very humble before them. It is equally important for every city to be thinking through its problems—which can be very much more specific and easily conceived. City planning can no more start with physical layout than a successful hospital or industrial plant design. MITCHELL

39 There have been several such studies and pamphlets, which Mr. Killam can read if he will cross over to the Littauer School. Two have been published by Public Administration Service and the Municipal Finance Officers Association. ASCHER

Tax studies should include analysis of the operation of other forms of taxation. It should be recognized that economic forces tend to compel the circumvention of tax burdens. For this reason, tax policy must be designed to foresee the consequences of all forms of taxation. HOLDEN

40 I have no spirit at the moment to comment, seriously, on an article which presupposes the necessity of continuing taxation in any form; especially for architects who, in the field of taxation, seem to be happy to travel per "horse and buggy," as Professor Killam implies they are traveling in the field of the building industry.

I should not like further to impede their progress, as I am sure I would do, did I attempt to answer even a few of the dozen questions Professor Killam asks on taxation. Similar questions have been asked a thousand times, and each question has called forth dozens of opinions such as you now seek; yet none can deny that none of these questions and answers have availed in the least degree against the progressive increase of TAXES—destructive of architecture, of the architectural profession, destructive of our country.

I sometimes wonder if perpetuation of taxation generally is accepted as "The American Way of Life?" Are TAXES so sacred to our institutions that their extinction may not even be considered? WILLCOX

Yes—and plenty of people are working on the problem. NRPB Urban Section has studies under way now. ASCHER

41 Certainly, large-scale enterprise in the building industry will be essential if rebuilding of our cities and rural areas is to take place on a comprehensive basis. The public's aversion to big business will be a handicap unless the public can be aroused to take part in the ownership of large-scale cooperative neighborhood corporations. It will be necessary to recognize that a man can own his home by considering his property a part of his neighborhood. When the property owner learns that it is safer to own a part of something good and strong than to own the whole of something which is ailing and weak, then he will give his support to large-scale enterprise in real estate and construction. HOLDEN

42 It is absolutely essential that the public understand the Building Code situation and align itself with the demand for reform. HOLDEN

answered by municipal assessors alone—real estate men, city planners, architects, engineers, merchants, and industrialists must all be consulted as to results.

The demand of real estate interests for a tax limit on real estate should be accompanied by succinct and well-publicized information as to how such limitations have worked, whether they have increased investments or profits in real estate, whether they have resulted in reduced municipal services, whether they have been accompanied by sales taxes and whether the sales taxes have cost the low-income families more or less than the tax reduction due to the limits. (39)

If real estate were taxed on the basis of income instead of on capital value would it put a premium on holding land idle in anticipation of a speculative rise in value? Are there other objections to such a basis? (40)

PRIVATE BUILDING

Architects should do their part toward encouraging private enterprise to undertake building development as far as practicable in place of Government building by subsidies. Insurance companies, banks, trusts, and foundations have billions of money invested in Government securities paying low rates of interest and in realty mortgages. (41) Can laws and customs be changed so that these institutions can be persuaded to invest directly in large scale rental housing for different income groups? It has been suggested that the Federal government might help this effort by guaranteeing a minimum return plus the whole of the principal. Should FHA legislation be amended so as to aid in rehabilitation of blighted districts? Should institutional lenders be urged to cooperate in blighted districts so that there will be general neighborhood rehabilitation instead of spotty individual residence repairs?

CODES OUT-MODED

The building code situation is unsatisfactory. (42) If great sums are to be spent on construction, codes should be brought up to date, standardized as far as practicable and unfair and uneconomical provisions eliminated. What is more fundamental, the political and legal limitations which now make it difficult to write a good code, difficult to enforce it, and above all difficult to keep it up to date, should be changed. For instance,

the "Plumbing Manual" and the "Recommended Building Code Requirements for New Building Construction" issued by the Federal government cannot be generally adopted because many provisions are covered by reference to ASTM or Federal standards instead of being printed in full. (43) In some jurisdictions at least, such reference to standards is not allowed. **As far as practicable, building codes should be written and amended by committees of experienced technical men, not by politicians.**

ARCHITECT AS CITIZEN

There is of course every reason for the architect to be a good citizen and, particularly at present, that means study of all of the problems of these changing times. He needs to know something of the character and costs of municipal services as affected by real estate development, something about taxation. He needs to have a detached, informed and fair point of view as to the best way to spend public money. (44) He should not be too much influenced by reformers or "better world" advocates who do not care where the money comes from. (45) An illiterate and civically inexperienced architect is not likely to be very effective as a leader in bringing forth a better society by mere assertion of his importance. The architectural profession is a numerically unimportant part of the building industry. (46) The profession has no such numbers as the legal, medical, and engineering professions nor does it command the respect that they do, particularly in war time. The industry of which we are a part is under continual criticism as being backward, disorganized, inefficient, and suffering from monopoly, collusion, and rackets. The architects' present influence is so small as compared with other more dominant groups that he is not likely to be important as an "architect-leader-citizen," as a leader for a "better society," a "humane civilization," "social gains," or for a world relieved from "fear of want." (47) **We had better do our part of the job so well that the public will respect architecture as a profession and building as an industry.** (48)

Our own job now is to cooperate at once with all other elements in the whole industry, we to furnish definite specifications for physical planning for urban rehabilitation when the peace comes. (49)

43 This is the least of the obstacles. ASCHER

44 I like what Professor Killam says about the Architect preparing himself with *sound understanding* so as not to be misled by the unthinking people who mean well but know nothing except that they want a "better world." Too many people are over-ready to try any expedient on the chance that it may effect a magic cure. The Architect must not follow this sort of leadership even if the "better world" people suggest a subsidy for construction. HOLDEN

45 Dear Mr. Killam fulminates against the "better world" advocates, but comes out with nothing different from their proposals. He starts as though he were going to emphasize some new principles of land planning and civic design, but comes out just where "Better Cities" comes out—that the real stumbling blocks are our legal, administrative, and economic institutions. He simply is not aware of the work going on in these areas. ASCHER

46 There is certainly a great deal that the architectural profession can do to assist in the redevelopment of urban blighted areas and I agree in general with many of the points Professor Killam makes. However, my own opinion is that architectural, engineering, and city planning techniques are much further developed than are the techniques of municipal finance and public administration; that technical planning skill will not be found wanting when the opportunity for putting it to effective use is presented; and that the fact must be faced that the real obstacles to sound and comprehensive urban redevelopment are political and economic rather than physical. This is not put forward as an alibi for the planner but its recognition would eliminate a lot of waste motion by professional groups which feel that the solution is their entire responsibility. ADAMS

47 Let the architect not be too modest. Let him provide some of the needed leadership. MITCHELL

48 I recommend to Mr. Killam Mr. Charles Ascher's "Better Cities," published this year by the National Resources Planning Board. This might be called an Atlantic Charter for urban planning and sets up plenty of goals to shoot at. I thoroughly agree with Mr. Killam's paragraph on the need for architects to acquaint themselves with civic problems. Some of us have been urging this for years and have been attempting to interest the architect in what has been considered by the profession as extra curricular. I would recommend that if Mr. Killam really wants to study standards he acquaint himself with the standards established by the Committee on Hygiene of Houses, of the American Health Association. These are, in my opinion, the best standards which have so far been set up scientifically by any institution in an attempt to reach working criteria on architectural design and community planning as it relates to residential areas. More of this kind of study is needed. FEISS

49 That the planners are not ready is no indictment of them. That the country is not ready to accept planning *is* an indictment of our profession, our technical men, of our citizenry at large. If the material for planning is not ready at this time it is not because the planners have not tried to prepare it. Mr. Killam will find, in any good planning library, the evidence that planners have long been working on the subjects he worries about. FEISS

I don't at all like Professor Killam's last sentence. Certainly the most important thing for Architects to do is to cooperate with other elements as he says, but we should not assume that we can quickly furnish definite specifications for physical planning. We can give direction to physical planning but do not let us be too definite about whither planning may lead us. From time to time we will furnish specifications for physical construction and change, but planning itself must be the result of careful analysis, diagnosis, and the formulation of a program. HOLDEN





WHO'D SERVE MUST SEARCH!

ARTHUR C. HOLDEN

THE place of the architect in the productive process is shaped not alone by the things that need to be done but by the capacity of others besides himself to perform services. That breadth of understanding which we insist is the prerequisite of the successful architect, must include an understanding of the forces which compete with him.

Let us suppose that, in a given region, the number of buildings needed is exactly known. It does not follow that the public in this region will turn to architects as best qualified to satisfy these specific needs.

Architects recognize this possibility, but being a conscientious hard-working group, they take philosophically repeated evidences of lack of appreciation on the part of the general public. But no matter how devoted to their principles architects may be, martyrdom is not a practical method for daily procedure. Consequently, the suggestion is frequently made that the way to combat lack of appreciation is to "sell the architect to the public." Sincere efforts at salesmanship, however, are too often unsuccessful, not because architects do not have a good product for sale, but because they are **abysmally ignorant of the products and services which are offered by their competitors.**



THE ARCHITECT FACES "COMPETITIVE FORCES"

Architects must remember that they are not competing solely against other architects. When the public seeks to satisfy a need, it turns first to the type of specialist which seems most evidently equipped to satisfy the specific need. Super-specialists are already in existence who have made it their business to concentrate on some of the particular functions of the architect. At one extreme there is the **stylist** who emphasizes design from the point of view of aspect. At another extreme is the efficiency engineer who emphasizes the approach by way of co-

ordination and management. Both functions are part of the service which the architect is or should be equipped to render. The architect, however, has been eclipsed in salesmanship by competitors of this type whose focus is more specific.



THE PUBLIC WANTS RESULTS

The architect would be a better salesman of his own ability if he were to place more emphasis upon the relationship between his own work and the work of others. He should recognize that just as others can perform many of his functions, so he may develop capacities for rendering auxiliary or related services, and thus broaden his usefulness. Above all the architect should recognize that the public cares more about results than it does about the agent through whom the results are obtained. A very good case in point is that of the real estate developer or developing builder. His method may differ from the method of the architect but his service includes the more obvious part of the architectural function, and he produces a final product ready for use by the public. In many ways the architect, with his more limited approach, stands at a distinct disadvantage beside the developing builder, yet functionally there is no reason why the architect cannot assume a similar role.

Irrespective of whether an individual architect may or may not intend to become a developing builder, **architects in general should recognize that they are concerned in the development and redevelopment of real property.** The architect's function touches the function of the real estate administrator just as fundamentally as it touches the function of the structural designer and builder.



THE BLUEPRINT IS A RED HERRING

The architect has suffered because he has permitted himself to be thought of as a mere draftsman who produced blueprints, rather than as a man trained to analyze a problem and offer a solution.

Architects have truthfully emphasized the fact that it costs money to produce drawings, especially complicated and exact scale drawings. In doing this, however, architects have built up a psychological obstacle against themselves. The public needs competent advice much more than it needs perfect drawings. As a matter of fact, the public has learned that it can get the minimum drawings required from those who furnish various essential materials. The plumber will gladly make a plumbing plan in order to get the plumbing work. The heating contractor must make shop drawings in order to put his materials together; he will gladly furnish all the drawings necessary if he can get the work. The steel fabricator will gladly furnish all needed structural steel drawings if he can get the business.

Lumber for the small frame house has customarily been cut and set at the job. Formerly the carpenter was expected to work out the dimensions of framing members and to employ his skill in putting them together. Although some sort of diagram is needed by the carpenter to lay out his frame, something far less complicated than the architect's plan will suffice. Indeed, typical architect's plans for small houses often neglect to give basic information needed for laying out the framing members. Lumber supply dealers want to sell lumber and carpenters want the job of erecting houses; therefore it is not unnatural that both lumber dealers and carpenters should be quite willing to supply diagrams which they have already successfully used, in order to get more work.

The architect has not always been awake to the significance of competing forces.



WISE SUBDIVISION NEEDS THE ARCHITECT

In the larger aspects of design, where the group arrangement of buildings is to be considered, the architect is brought into unintended competition with many types of specialists. The surveyor's real work is the determination of legal boundaries between parcels of property in such a way that they can be described in the deeds prepared by specialists in the law. Accurate surveys for record are an essential part of any development; but record surveys should be distinguished from reconnaissance surveys. Surveyors, in order to get work, have been furnishing serv-

ices which are properly the province of the designing architect. As a result of this situation, the public has had property sold to it with boundaries determined by the terms that can be most conveniently described by lawyers and surveyors. Property has been laid out as though it were a commodity to be easily exchanged. Accordingly, the very form of our cities has been shaped as much by lawyers and the surveyors who have worked for them, as it has been set by architects. So far as cities are concerned, architects are expected to do their best within lot and street lines established by others. Architects, instead of being leaders, are too frequently mere accessories after the fact.



THE RURAL NEED FOR ARCHITECTURAL AID

If an architect were to ask himself, "What does my profession mean to the farmer?" the answer would not be one to enhance his self-respect. **The farmer looks for help to the man who has studied his problems.** The architect has given little thought to the farmer because he has been too much absorbed in his own difficulties and his struggle to get work in city and suburb. It has been the salesman of conveyor tracks and tackles and the salesman of pipe stanchions and ventilating machinery, plus the ever-ready lumber dealer, who have come to the farmer's rescue. If a farmer can scrape together enough cash to pay for a conveyor system, the obliging salesman will be willing to furnish him with a stock set of plans for the barn, and he will also go to no end of trouble to help the farmer to secure the financing needed to build his barn.

The forces which have changed farm life have been mechanical. The decline in the importance of the horse had its effect upon the fields where hay was grown and upon barns where hay was stored, and upon the economy of the farmer who was confronted with the need for an annual outlay for the purchase of fertilizers, plus larger capital investments for tractors and other types of farm machinery. These were changes which took place quite outside the comprehension of the architects, except that architects seemed to realize that the day had gone by when farmers possessed surplus capital with which to build themselves better and more commodious homes. Hence architects as a group looked away from the problems of farms and rural communities because they seemed no longer attractive to their particular talents.

Few architects are in touch with the mechanical and economic changes which are still taking place in rural life. Farmers can send a few postage stamps to the U. S. Department of Agriculture or to the State agricultural colleges and receive circulars of advice on subjects ranging from the installation of sanitary equipment to the preservation of foodstuffs. Architects have neglected to keep themselves posted on what is being done in Government bureaus and have failed to make themselves useful local interpreters and advisers with respect to the carrying out of information which has to do with construction and physical change. Recent developments in refrigeration, canning, and packaging, alone, suggest that **architects who are sensitive to these trends might again make themselves useful to the rural community through aiding in developing types of small co-operative plants and stations that could give to groups of farmers advantages which none of them as individuals have yet been able to afford.**

Under the leadership of the Federal Government, experiments have been initiated to study the problem of the farm community. This has been on much the same plane as governmental attempts to deal with the housing problem. The powers of government can cut the Gordian knot of economic obstacles and create patterns of model farm communities. This does not mean, however, that the way has been found to make available to all farmers the delightful things that can be thought up when economic considerations are temporarily brushed aside by governmental resources. Architects can make the decision as to whether they would prefer to become employees of the government upon governmental demonstration projects or whether they desire to address themselves to finding out how to overcome the economic obstacles which have prevented the great bulk of farmers from utilizing the technical capacity which architects are capable of rendering. **Upon the attitude of the architect will depend whether the development of the rural community is to be shaped by the force of example furnished by governmental ex-**

periments, by the contributions of vendors of mechanical improvements, or whether it is to be moulded by a co-ordinating force such as the architect should be able to wield.



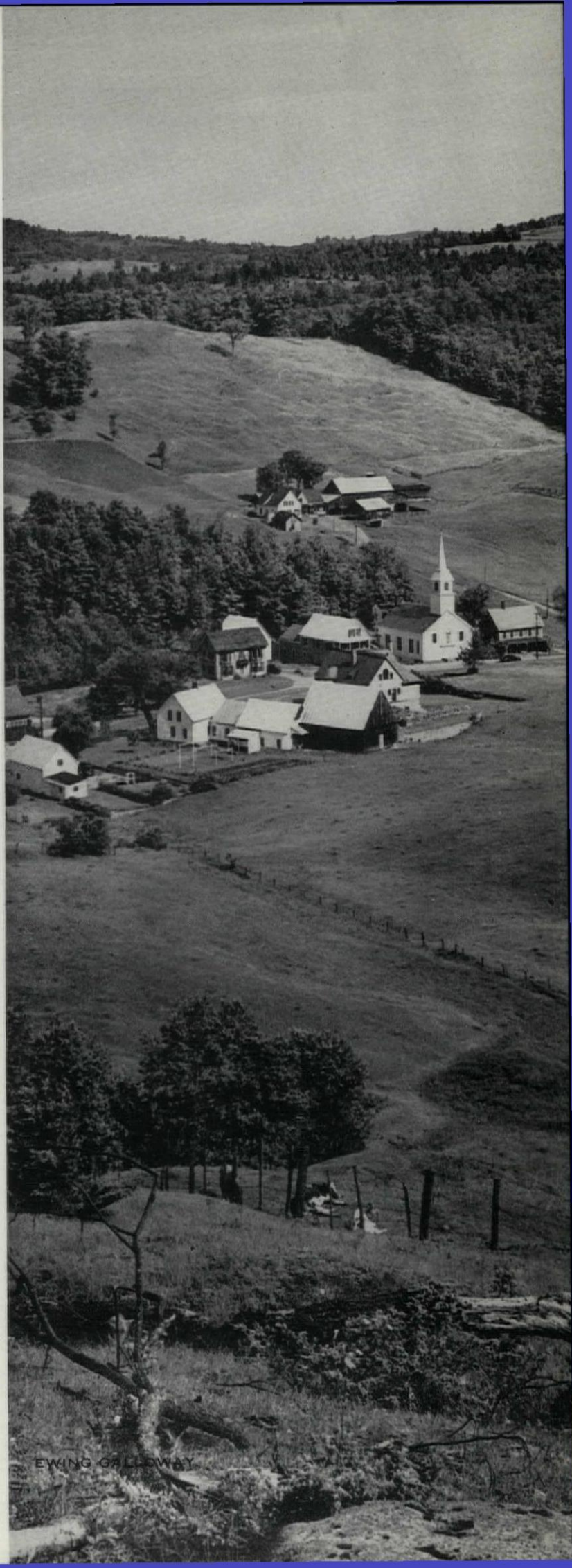
ARCHITECTS MUST LOOK BENEATH THE SURFACE

Although the urgency which furnished work for architects at the crest of the boom periods in the past cannot be counted on to keep them continuously employed, it is clear that both during and after the war there will be new frontiers which will call for a high degree of initiative and ingenuity. These new frontiers are hidden beneath the ordinary happenings of daily life. They are evident only to the man who looks beneath the surface and attempts to understand the forces which mould social and economic life. If architects are to cope successfully with these forces they must be alert to key their work into the work of other professions and trades. They must know how and by whom farms can be equipped. They must know how great cities grow and how to direct their growth. They must know how villages expand. **They must make it their business to know whether the thousands of small houses which are built each year have all the quality which modern technology is capable of producing.**

If architects know they have the capacity to give a better service than the public is getting, they should do whatever is necessary to give the public the benefit of that service. **They should not waste their time complaining about lack of appreciation.**

Wherever architects may be carried by the war, let them observe how people live and behave. Let them seek to serve people and to demonstrate that technical advances exist to be enjoyed by all.

It is clear that the architect, at least the architect in the restricted position into which he has put himself today, has been slow to recognize the forces which sway the combination of trades and professions by whose joint effort farms are equipped, cities are laid out, great modern buildings are built, and thousands of small houses are produced. Let the architect shift his position. He will be less bruised by the jolts of society. It may be that by thinking less of his own prerogatives and more of society, he may even be able to lessen the jolts which society has been accustomed to receiving.



WASHINGTON RESUMPTION

The A.I.A. announces the appointment of D. K. E. Fisher, Jr., Baltimore Architect, to succeed Edmund R. Purves as Washington representative for the profession. Mr. Fisher will assume his new duties at the Octagon House, in Washington, on or about September 15, 1942. The appointment culminates a two months' search for the right man to do this important job—a search made doubly difficult by the demands of Army and Navy which called out several candidates while negotiations with them were under way.

Mr. Fisher is an excellent choice. He is vigorous and aggressive and well aware of the responsibility and opportunity for service he has accepted. He has an excellent background of education and professional practice which equips him to be an able spokesman for the architect in general.*

In accordance with the vote of the delegates to Detroit last June, it is the desire of the Institute membership that the type of activities carried on up to that time, by both Institute Representative Edmund Purves and PENCIL POINTS-sponsored Willis A. Vogel, should be continued under Institute auspices. It thus devolves upon Mr. Fisher to act as liaison officer between the entire profession and the Federal Government legislative and administrative departments. It will be his duty to assist architectural men in every possible way to establish contact with sources of Government work whereby they can be of service in the Victory effort.

«««« »»»»

It may not be amiss at this point to point out that a fundamental, though temporary, change has taken and still is taking place in the architectural set-up. When the War began, the great majority of architects were maintaining their own independent practices. With the development of priorities and restrictions on private building, more and more architects became salaried employees of the larger architectural or engineering offices, of large corporations, or of Government. In these capacities they are still functioning as architects, but with somewhat different economic positions.

We have no statistics on the extent to which this change has proceeded, but we hazard a guess that more than half of those architects who are actively working today are in the position of employees. No man can say how long this condition will last, since that depends on the duration of the War and on the possibility of post-war planning getting effectively under way.

This being the case, the thought arises that the A.I.A., as the recognized national representative body, might be called upon to deal with some of the abuses of the rights of employees that appear to be cropping up here and there.

We have a letter from an architect now working as an employee on a war project in which he describes some of these abuses.

"As our country goes more and more 'all out' for the war effort our engineering, architectural personnel and kindred professions become more closely aligned with defense projects, since private building has almost ceased.

"This means that our services are often arranged when an advertisement (sometimes blind) permits us to establish a contact with a concern of whom we know absolutely nothing; its history, policies, contract terms with the Army or Navy, the duration or scope of the project; nor is it possible to procure information concerning these items.

"In the majority of cases, salaries offered to competent engineers and architects are insufficient to afford consideration of the temporary nature of employment, the high cost of living in these areas, and the necessity of providing for two places of residence as may be required.

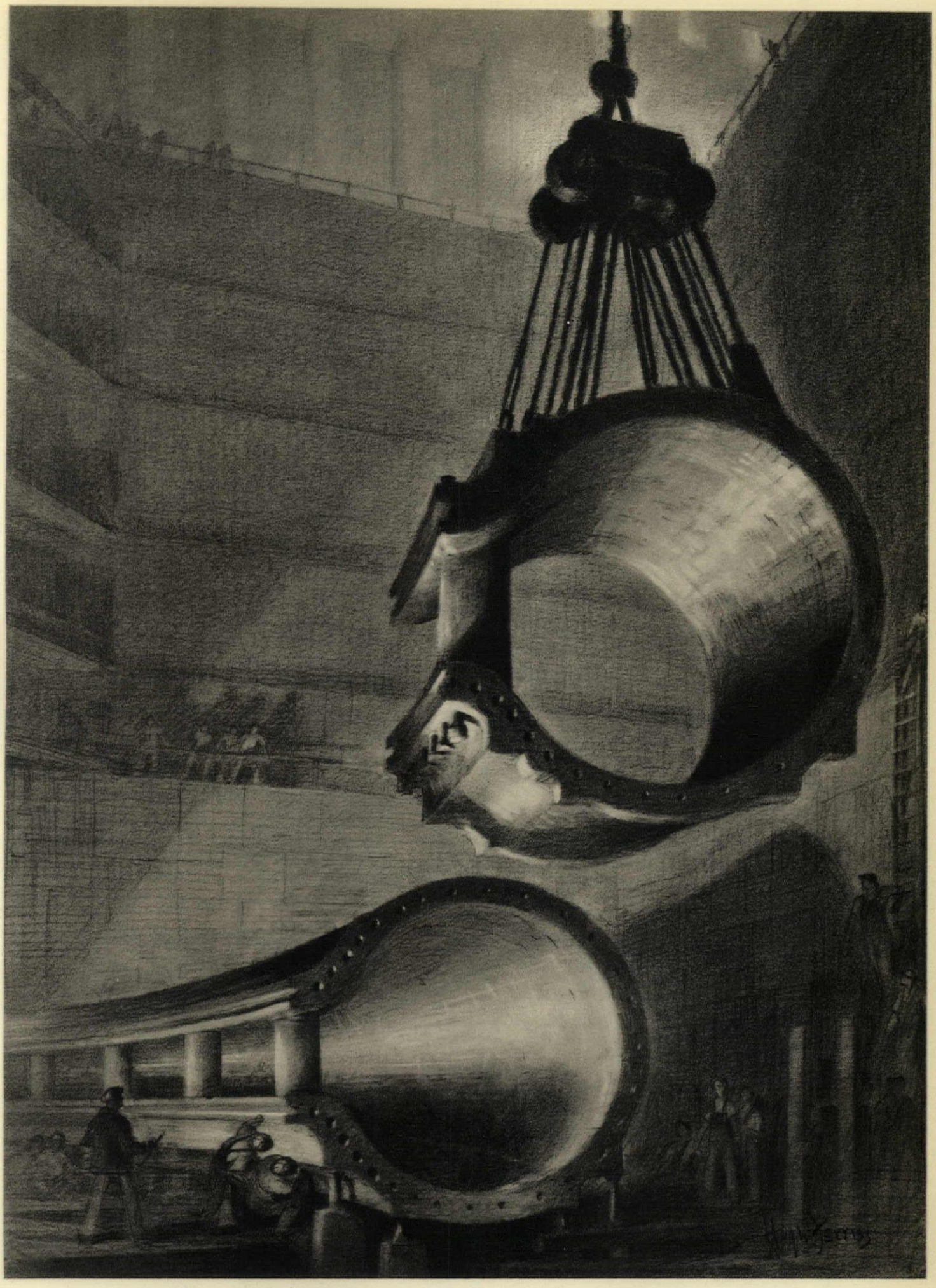
"After acceptance of these positions men have found that, without cause or previous agreement, salaries have been reduced, hours increased, restrictions enacted that confine their movement or customs under which they had been previously employed. Often those in charge are thoroughly incompetent, unable or unwilling to accept any responsibility.

"Without any 'deadline' warning to their personnel these employers, together with other organizations, seem to have reached an agreement that prohibits men from leaving one organization and procuring employment from other defense projects, or even corresponding with other organizations through which future employment might be obtained."

Without suggesting that the A.I.A. should function as a labor union, we suggest that some consideration might be given to ways and means of dealing with these and allied problems.

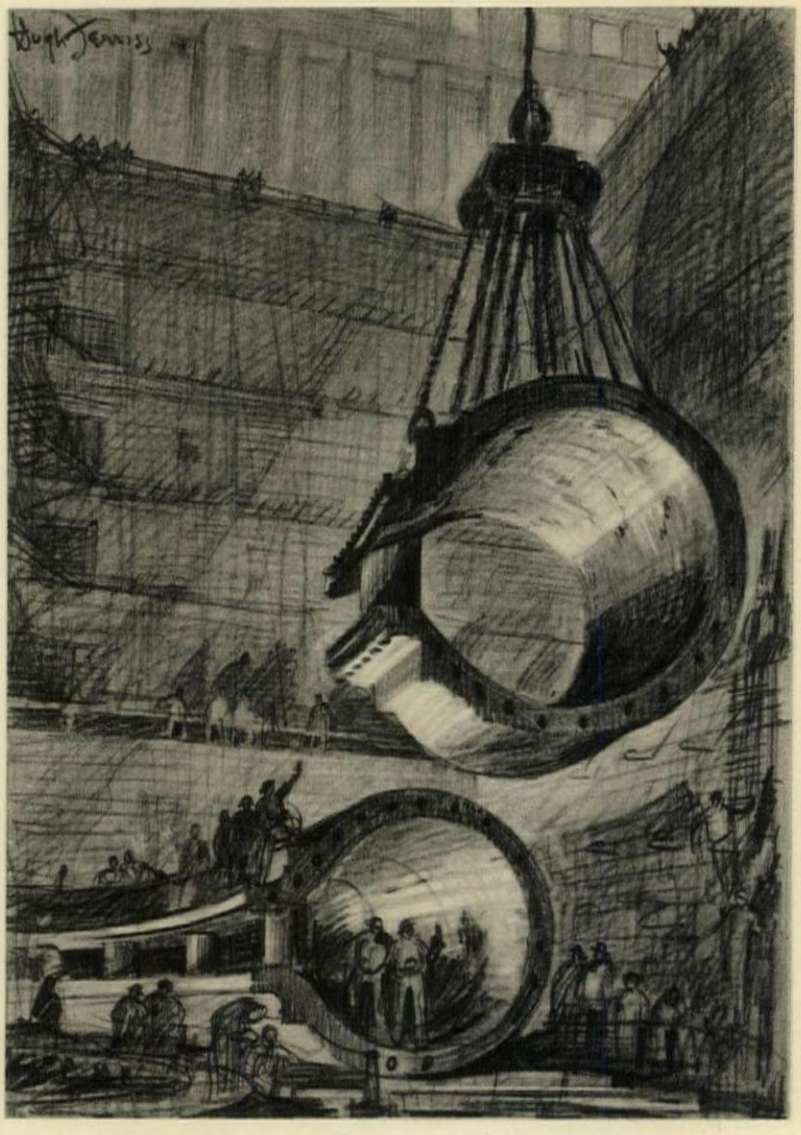
K. R.

*Member of firm of Taylor and Fisher, Architects. Graduate of Princeton and M.I.T. Over 20 years of general architectural experience (design, specifications, and supervision). President, Baltimore Chapter, A.I.A., 2 years, Board, 6 years; President, Building Congress and Exchange, 2 years, Board, 4 years; Member, Mayor's Committee on City Plan, Baltimore, 2 years; Member, Advisory Board, School of Architecture, Princeton University, 7 years; A.I.A. Committee Construction Industry Relations, 2 years; A.I.A. Chap. Committee Baltimore-Washington Regional Plan, 6 years; Vice-Chairman A.I.A. Committee on National Capitol.



ASSEMBLING THE TURBINE, GRAND COULEE

Conducted by Major Hutton of the Bureau of Reclamation, we went down about six stories below ground level, in the Power House, and came onto this scene. The turbine was being assembled; it just happened that the large section of pipe was being lowered as we stood there. Aside from pictorial elements, the scene seemed to suggest quite a lot about generating power. Fortunately, the heavy casting was being lowered very slowly; even at that, one had to sketch rapidly to get things in reasonably accurate location. I knew right away that New York friends would accuse me of exaggerating scale so I got the Bureau's photographer to record the scene at the same moment the sketch was under way; his photograph is Exhibit A in support of the contention that the men shown are *not* 4'-6" tall!



The sketch was made with Pluvius pencil on a pad of tracing paper; the final drawing, after return to studio, was made with Wolff crayon, paper stump, kneaded eraser and kid finish bristol board. Thus, the final is made with tone, the sketch more with line, and I prefer the sketch.

Hugh Ferriss

WAR, VICTORY, A NEW WORLD

Students Replan An Industrial Center

IN THE belief that decent shelter, attractive neighborhoods, recreational facilities for all, and improved public services **must be planned now** if there is to be a higher standard of living in the post-war world, the Seniors in the School of Architecture, Washington University, St. Louis, undertook early this year to redesign near-by Granite City, Illinois, as a city planning problem. The objective value of the project that resulted—in which students and faculty of the entire School of Architecture collaborated—is suggested by the presentation on the following pages. The photographs reproduced were selected from those comprising an exhibition of the Granite City Replanning Project. Maps, plans, and models made by the students to represent the transformation that might take place after the pressure of war production has lessened, were shown.

Significant was official cooperation given the student architects working under the guidance of Professor Joseph D. Murphy, by the civic leaders of Granite City, notably the late Mayor M. E. Kirkpatrick* and G. Hayward Niedringhaus, President of the Granite City Steel Company, whose grandfather founded this unit of St. Louis' industrial East Side, about five miles from the center of the metropolitan area.

The exhibition filled two galleries of the St. Louis Art Museum for two weeks in May. Mayor Kirkpatrick, Chancellor Throop, of Washington University, and local A.I.A. leaders were special guests at the opening. Every effort also was made to publicize this project of the Washington University student architects as vital propaganda for **post war planning now.** The "Granite City Press-Record" featured a series of articles explaining the exhibit and pointing to the tangible values that could be realized, for the profit of Granite City, if the replanning is carried out.

Four sections of the exhibit reflected the divisions within which the students' work was pursued. In order to prove their thesis—that human resources devoted to regeneration of an existing community could halt or avoid all the ills of the neglected sub-standard areas that burden too many American communities—they proceeded to study:

1. **Traffic and Transportation.** To avoid congestion within the city and provide communication with the surrounding region.
2. **Commerce and Industry.** To zone areas for greater convenience and attractiveness, and promote growth and permanent values.
3. **Housing.** To assure every American family a livable shelter at reasonable cost.
4. **Civic Works.** To provide better facilities for Health, Education, Recreation, and Government.

Central feature of the exhibition was a large model at a scale of 1″=150′ representing Granite City with the proposed improvements and existing development integrated. This model map, reproduced on the cover of this issue of THE NEW PENCIL POINTS, effectively shows the conclusions reached by the various student groups collaborating in the project.

In order that the entire School of Architecture, Architectural Engineering, and Interior Design might take part in the replanning of Granite City, problems of the buildings needed were given to all the Classes for solution. Studies of housing were carried to the design in detail of individual and row houses similar to those already built under USHA in Granite City.

*"Mayor Kirkpatrick, who was one of the most noble, honest social-minded men I have known and one who had the respect of labor and capital alike, died on July 8"— Professor Murphy

TRAFFIC AND



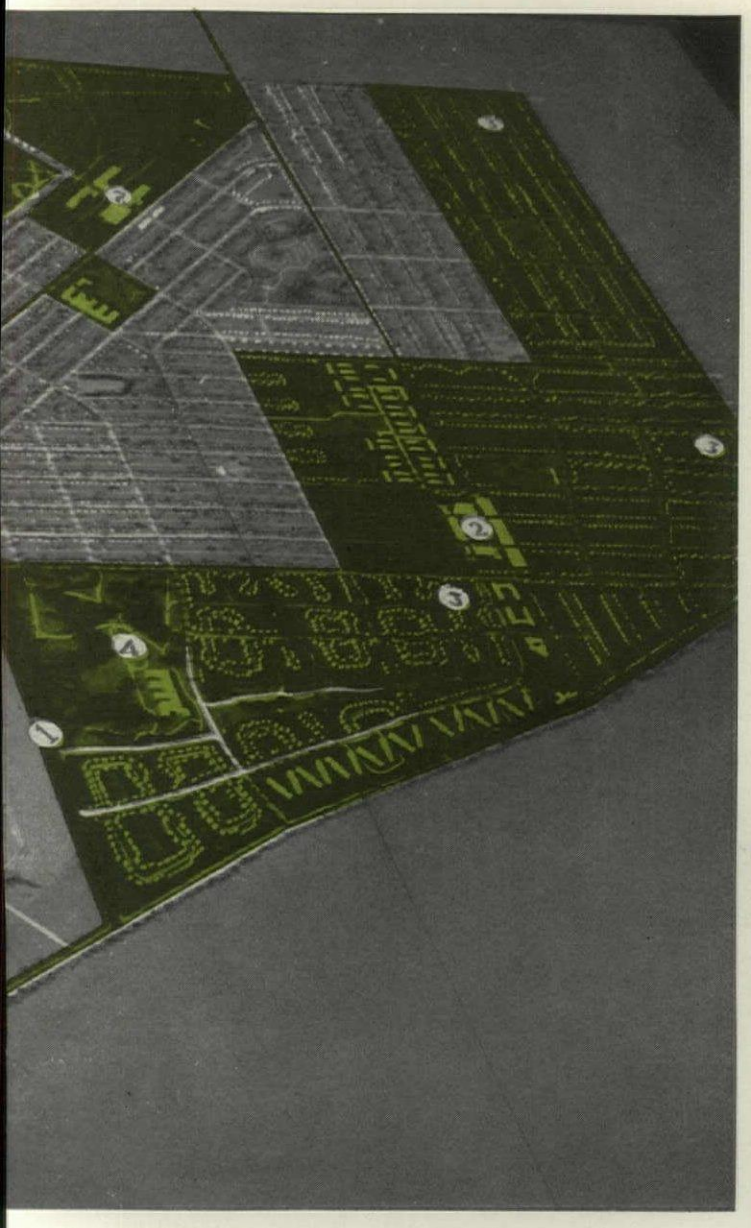
A survey of existing traffic conditions was first made, including points of congestion and danger, sources of traffic, destination of traffic, and traffic flow over main streets. The problem was then studied for redistribution of traffic flow, relief of congestion, and safe driving conditions.

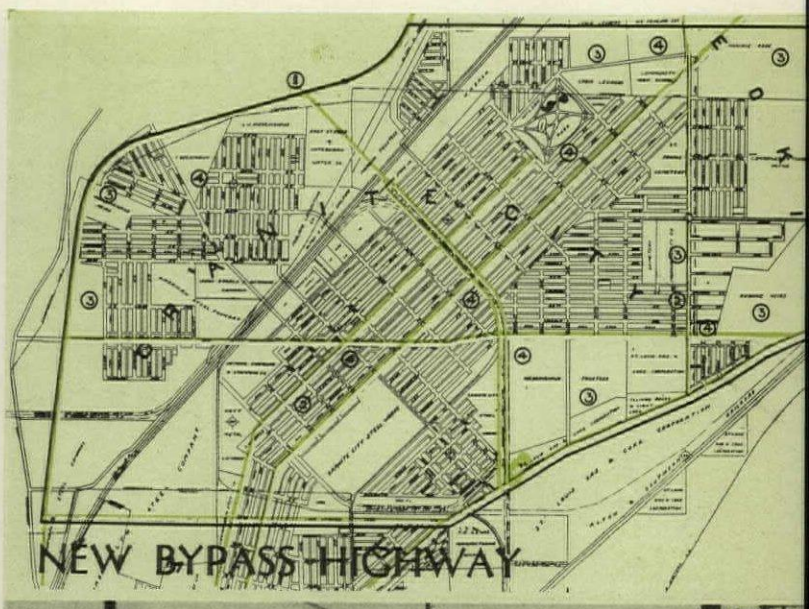
It was decided to take the traffic flow out of Granite City, from the center of town by the most direct route, and then, by means of two express highways, by-pass the towns of the immediate vicinity directly to the McKinley Bridge at one end and toward Alton on the proposed Riverview Drive, on the west side of town, and toward Edwardsville, on the east side of town. The two main outlet streets carrying the traffic to the express highways are Niedringhaus and 24th Boulevard. These streets were developed so as to carry a maximum amount of traffic away from the center of town in a short period of time. Both streets were supplied with viaducts over the railroad tracks at the west side of town.

A cloverleaf overpass was designed at the intersection of 24th and the new express highway on the western periphery and similar structures can be placed at the other four intersections if so desired. The express highways are composed of two 25-foot strips of concrete divided with an 18-foot parkway. The **traffic flow through the civic centers is handled by restricting parking** from Madison to Delmar along Niedringhaus. Stop lights were provided at the intersection at Madison and Niedringhaus; and at Edison and Niedringhaus, with provision for left turn on white light and right turn through corner drive at all times. All other intersections are well provided with Boulevard Stops with no Left Turn because of very sharp 45-degree turn in that direction.

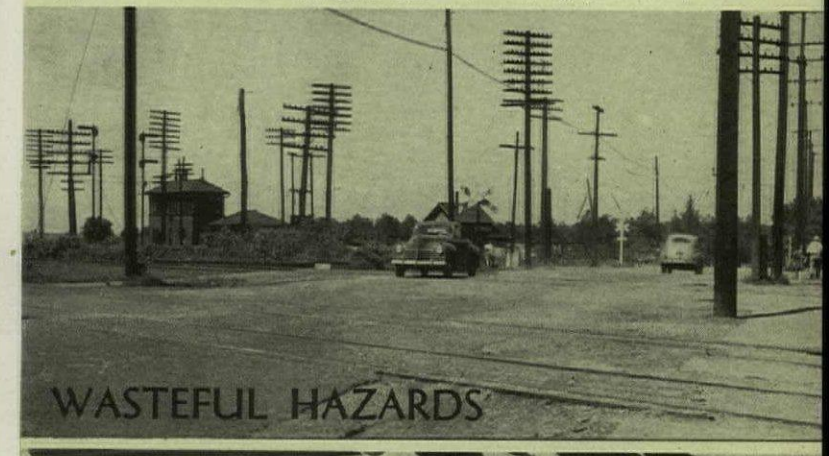
TRANSPORTATION

GRANITE CITY 1

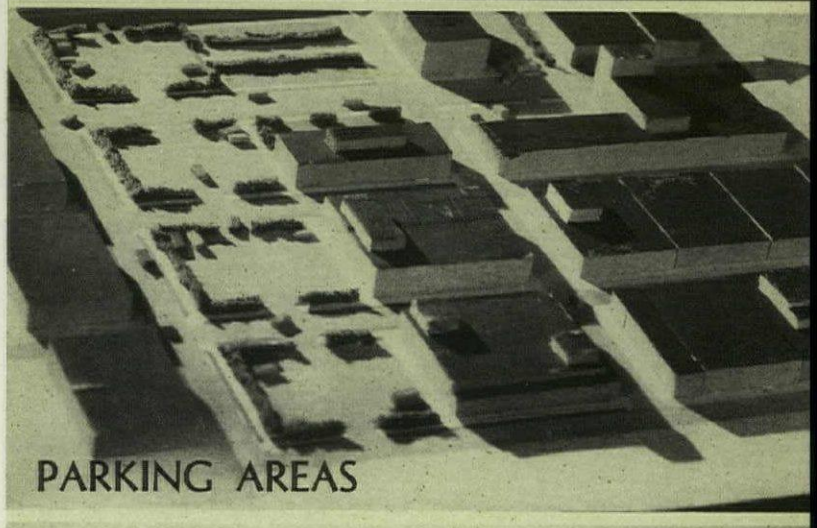




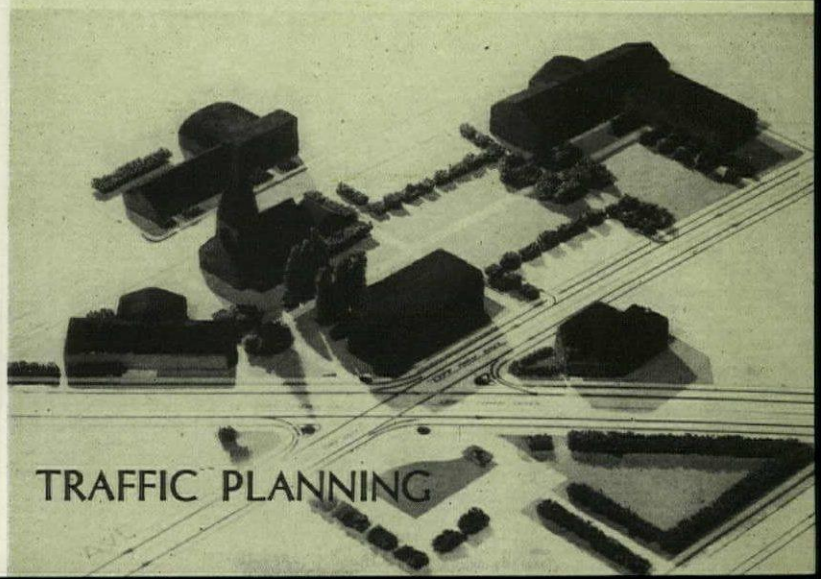
NEW BYPASS HIGHWAY



WASTEFUL HAZARDS



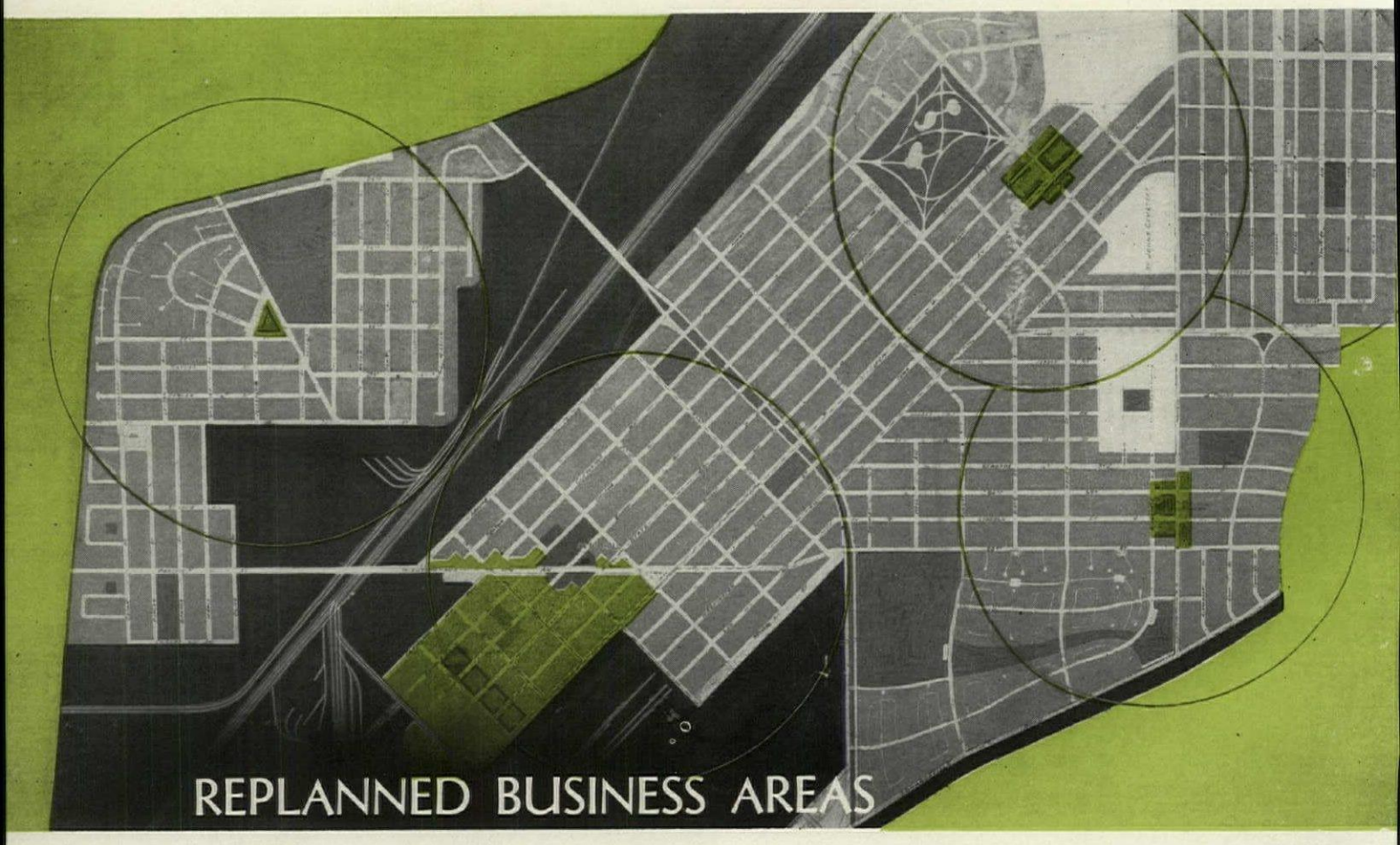
PARKING AREAS



TRAFFIC PLANNING

One other thing that has been planned with the purpose of relieving some of the apparent congestion at seemingly unimportant points: a quick glance at the map of old Granite City will reveal streets handling a moderate amount of traffic that suddenly run into dead-ends; they lead into the middle of another block with no possible means of continuing traffic along the same general direction. Such is the case on Niedringhaus to connect with 24th Boulevard. This naturally causes points of needless congestion. To remedy this situation, **it has been planned in some cases to continue the streets through the dead-end.** In some cases this necessitates the wrecking of a few houses, but most of the proposed continuation is through vacant property or through slum areas. Improvements in streets have been suggested not with the idea of beautifying certain areas, but to relieve congestion.

COMMERCE



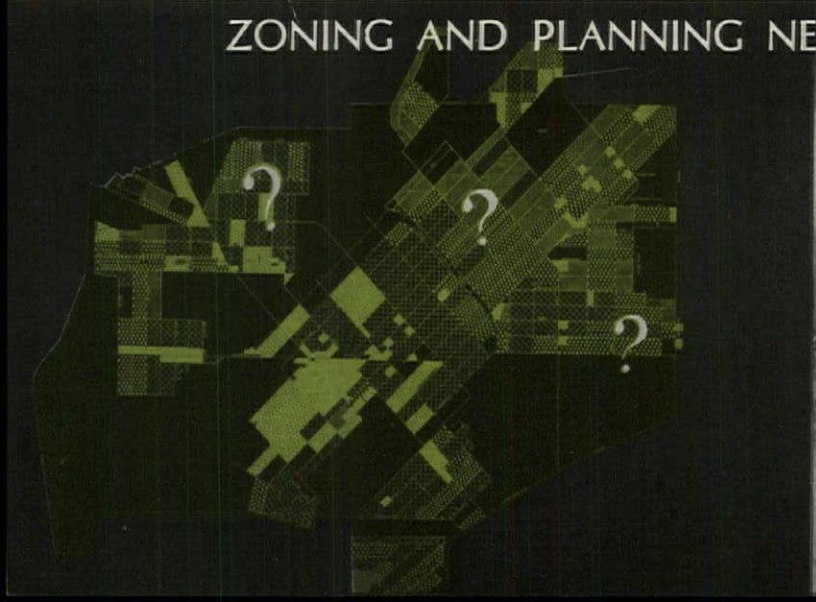
REPLANNED BUSINESS AREAS

Granite City exists because of its great industries and there is ample space for the expansion of industry as well as of the living facilities of the city. The lack of zoning, however, has caused a certain unplanned growth which is detrimental to the community as a whole. The city is surrounded by heavy industries to the south, west, and east. The northeastern part of the city has as yet been untouched.

Modern industry, so well typified by modern Detroit, sets the high standard that **almost any industrial building can be just as clean, healthful, and beautiful as one's home.** To have a well-planned town with due consideration given its employees and their families for cleanliness and health, Granite City should carefully consider the problems of zoning, smoke elimination, and additional sewering.

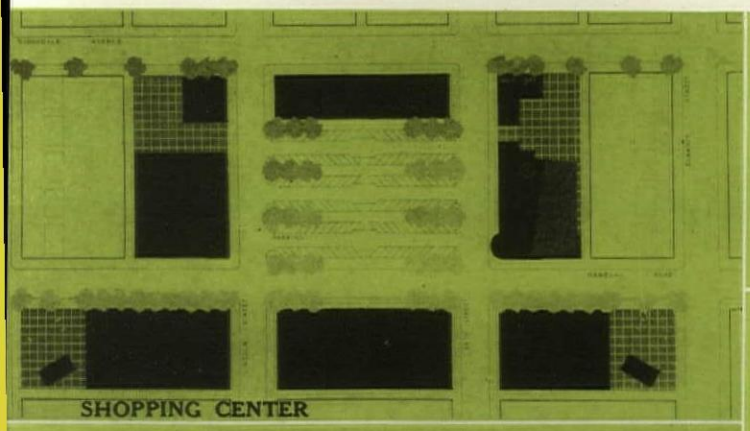
Transportation facilities in Granite City are excellent, in that several railroads offer full service adequately to the surrounding industries. Unfortunately, due to the scattered centers of these various industries, the city has too many highways crossing these rails. As is brought out in the "Transportation Division," these problems have been best resolved by means of viaducts, and overpasses at chosen centers. The Missis-

ZONING AND PLANNING NEEDED

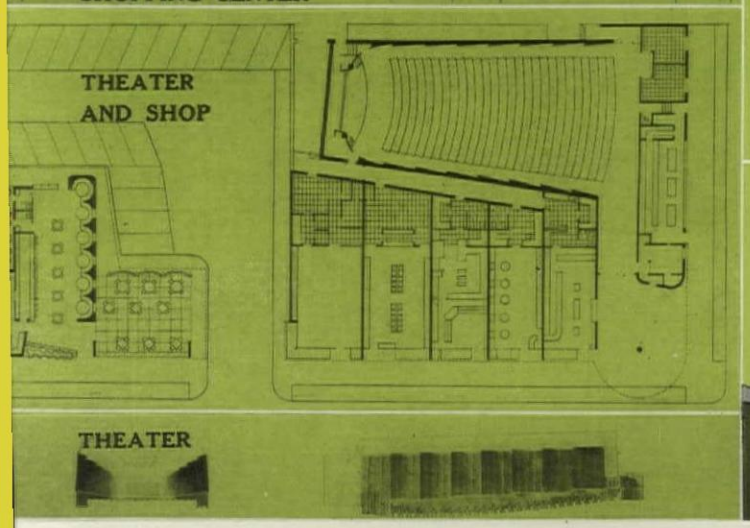




AND INDUSTRY

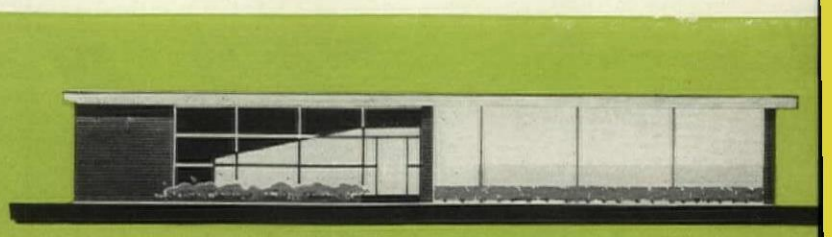


SHOPPING CENTER



THEATER AND SHOP

THEATER

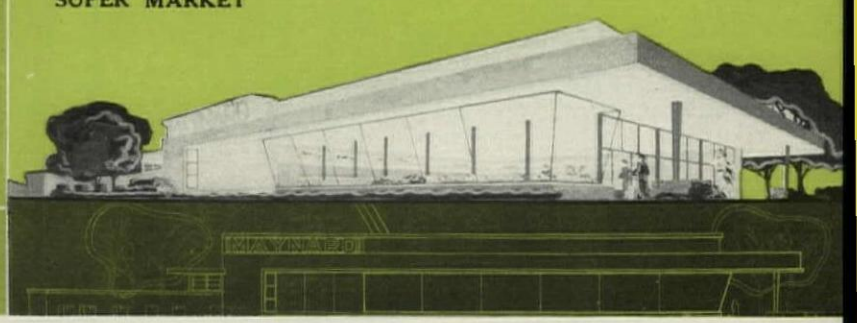


MILK BAR



SMALL SHOPS

SUPER MARKET



sippi River offers an excellent thoroughfare for the expanding river traffic. Since the city is close to the river, **loading docks and depots will surely develop** along the riverfront adjacent to Granite City.

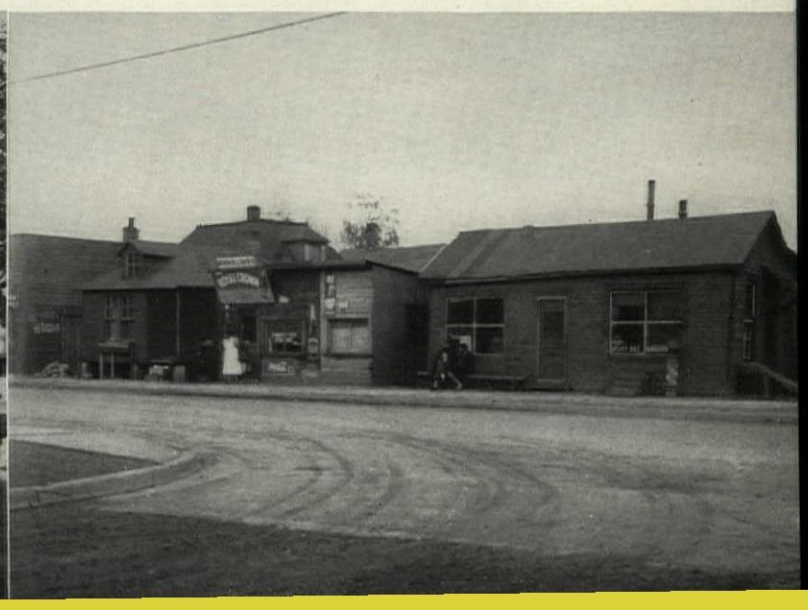
In addition to the necessary modernization of industrial buildings, **the downtown business district should be replanned for greater shopping convenience.** We also suggest the immediate adoption of the area south of 20th Street and four blocks wide to Madison Avenue on Edison, to be zoned for local commercial establishments. We propose an area covering the southern end of four consecutive blocks in this downtown area to be set aside for parking space or possible large commercial establishments, the former controlled by the city itself.

The exhibition describes by means of maps, models and drawings the development of shopping centers proposed for Granite City and also proposes certain boundaries of the industrial areas.

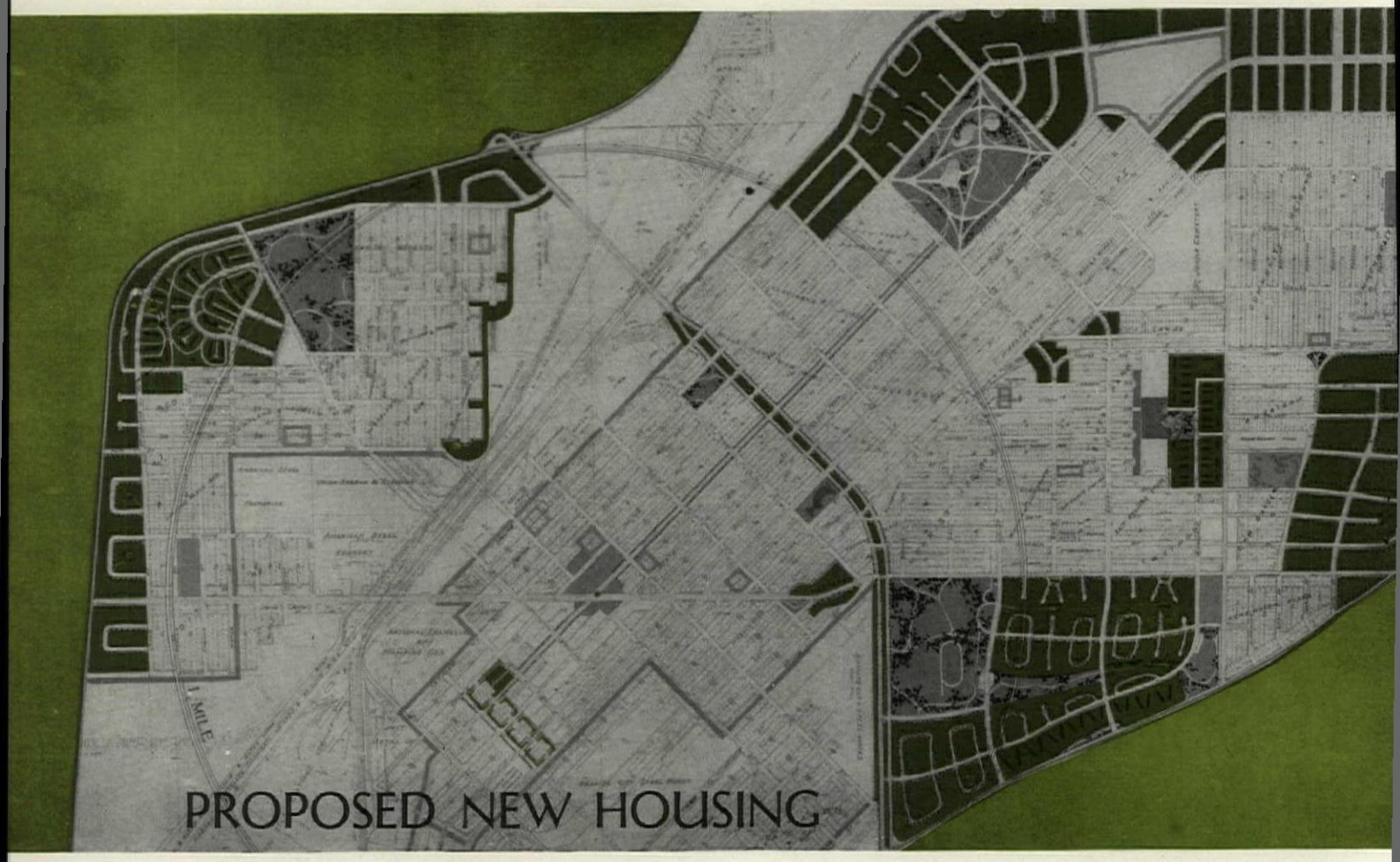
It must be remembered that whatever realizations of these proposed zoning and commercial developments are evolved will be the result of the **fullest cooperation between the citizens, the industries and the civic government** of Granite City.

WARREN M. JOLLEY





HOUSING



PROPOSED NEW HOUSING

Photographs of the Granite City Re-Planning Exhibition comprising this presentation are by Charles Lorenz and Charles Trefts. The students enjoyed the assistance of the entire faculty of the School of Architecture, including Prof. Lawrence Hill, Chairman of the Department, and Professors Austin E. Fitch, Eugene Mackey, Paul Valenti, and Joseph D. Murphy; and Erwin Schmidt and Carl Thye. The housing models are by Susan Sallee, Graduate Student, who made them for her graduate thesis on housing



SUGGESTED LAND USE

HOUSING



USHA PROJECT CONSTRUCTED





The problem of housing in Granite City is that not only is there a need for replacing and rehabilitating present houses of sub-standard condition in many parts of the city —particularly in the area southeast of the Granite City Steel Works and in the area to the northwest of the American Steel Foundry—but there is the further **urgent need of 2,000 new houses to maintain the normal population.**

It is in these areas, designated as sub-standard, where conditions exist such as four families living in one small house, meager sanitary facilities or none at all, and a lack of sufficient light, air, or space for healthful living. Our proposals attempt to alleviate the present bad conditions and to add new districts which are well-planned.

As logical growth and expansion of the Granite City Steel Works takes place, it is



SINGLE FAMILY AREAS



ZONING NEEDED

HOUSING

felt that the area to the southeast of the present plant and following through to the Company's area along the old Eastern Belt Line Railroad will be a natural area into which the Company will move, so that district with its very poor living facilities has been zoned for industry. Adjacent to this area and on the other side of the old Belt Line Railroad, on whose bed we propose a city arterial highway leading to the Edwardsville Road to the south and the new Belt Line Highway to the north, we developed a large housing project on vacant lands between 23rd, Nameoki Road, Edwardsville Road, and the city highway previously mentioned. It is considered that from this area industries in any part of the city are easily accessible. The cost of the two and three bedroom houses, efficiently planned and including the lots, would range from $3500 to $5000. This neighborhood is further planned within itself, so that the majority of industry to the west is screened by a large park, and access to the park and schools by children is safely accomplished by the use of paths through the center of the project with a minimum number of streets to cross.

Four blocks to the north and bordering Nameoki Avenue to the west is another well planned housing area of the row-house or apartment type (10 to 12 families in one unit) where a minimum rent is possible, providing living facilities for families in the low-income brackets. The project is ideally located with regard to a business district directly to its south, and has ample playground areas within its boundaries for the children.

Mapped around the northeast corner of Wilson Park is a proposal to aid the new growth of $10,000 to $15,000 homes, and it is here that full advantage may be taken of the opportunities offered with more extensive and elaborate planning. The fineness of well-organized houses enhanced by beautiful landscaping cannot be overlooked.

Across the tracks to the northwest, bounded by the new belt line highway, Rock Road and 22nd Street, the final housing proposal was made. It is situated at the edge of a sub-standard neighborhood, a small portion of that neighborhood being encompassed by the new development, and the project is composed of row-house units of 10 families each, arranged in a convenient and interesting manner. Congestion in these areas will be removed and decent living for all provided.

It was considered impractical from the economical point of view to attempt the demolition of all existing sub-standard areas and the erection of new houses, but some rehabilitation work must be done for it should be remembered that **the new housing projects provide only those living facilities for the 2000 families now either without homes, or living with other families.**

The over-all approach to Housing in Granite City was primarily a practical one in which existing conditions, possibilities of future trends, and even political influences were considered, and recognition was given to each according to the measured relative value. Keeping practicability ever in mind, we have, however, attempted to engender a spirit of progressiveness and imaginativeness into every problem as it was studied in detail and we feel that it is only in this manner the New Granite City of the future can successfully be achieved. ALLAN WALTER





CIVIC WORKS

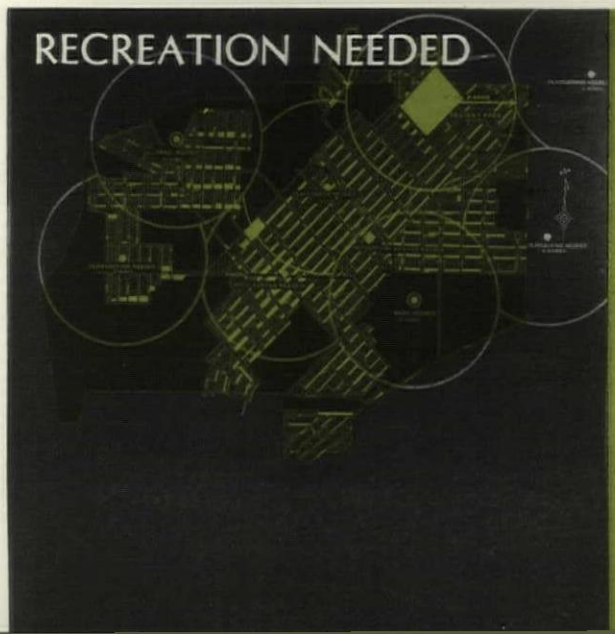


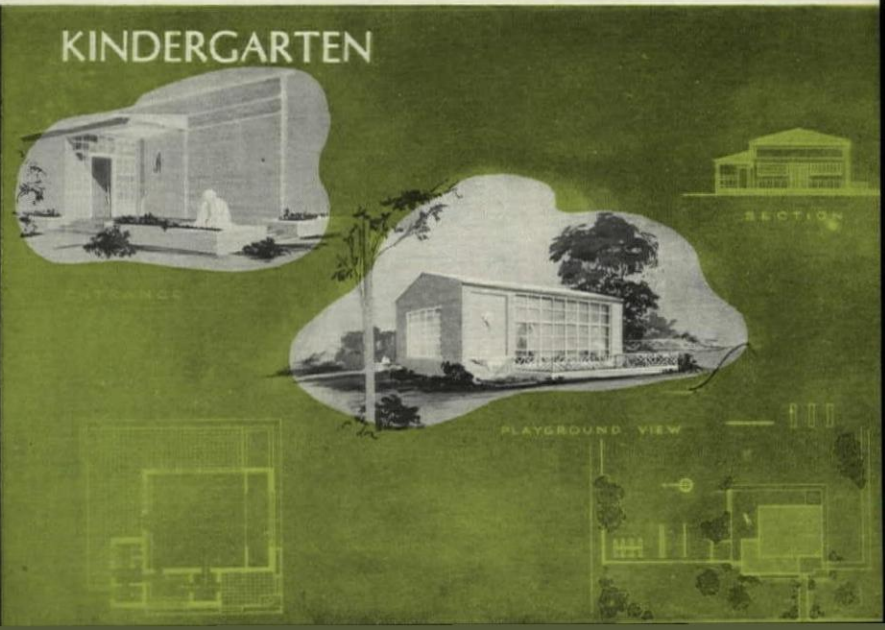
The problems undertaken by the student committee on Civic Work were parks, play grounds, schools, recreation centers, and the civic center.

The most urgent need seemed to this committee to be more room for play and recreation. According to good practice as proposed by the Illinois State Planning Commission, **an adequate park should be within a half-mile radius of the homes it serves.** In order to meet this requirement, two other parks the size of Wilson Park and several play areas for small children are needed, and have been provided and well located on the plans. One of the new parks is in the residential area west of the railroad tracks and one in the newly-planned area on the east side of town.

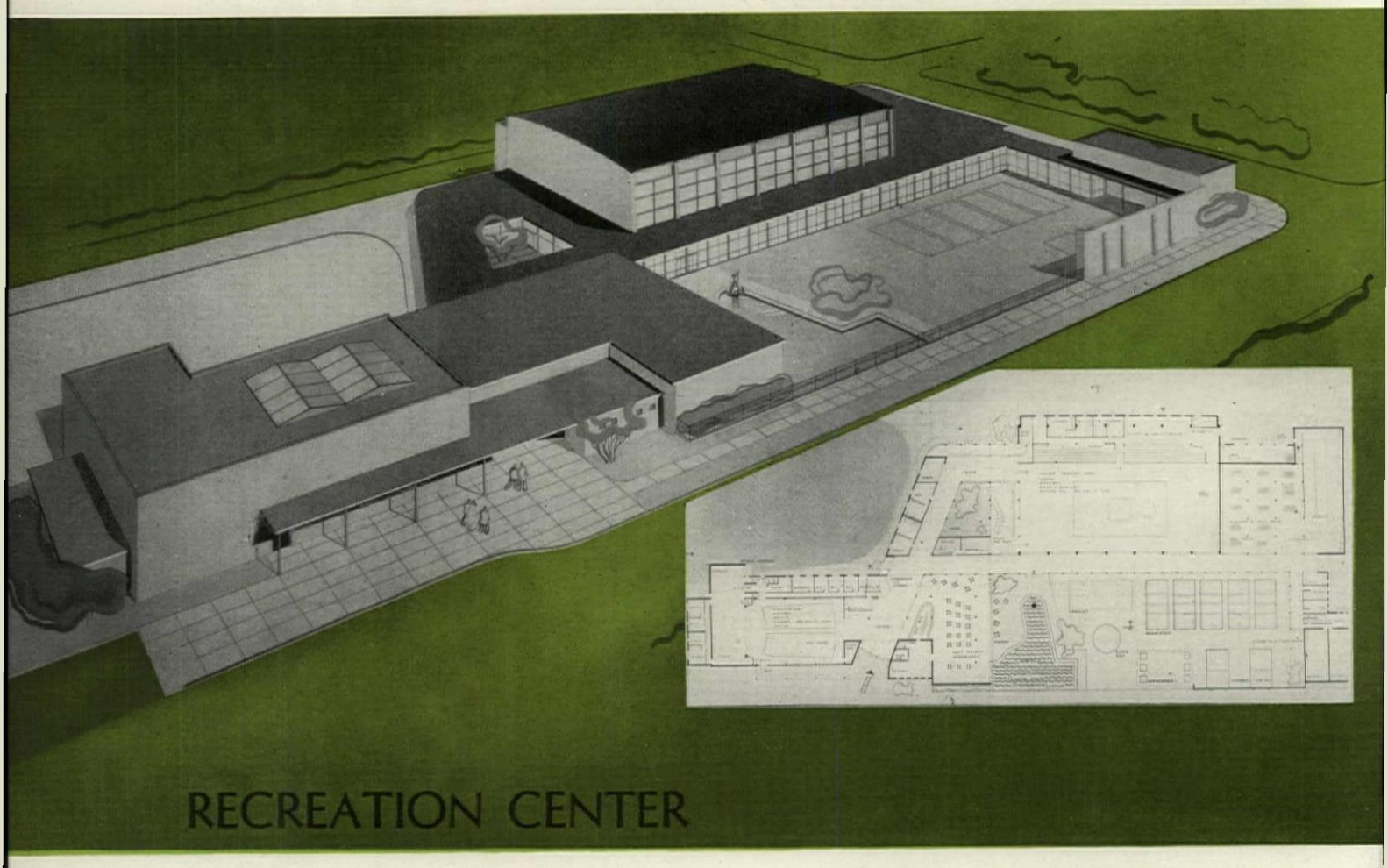
The close cooperation of this committee with the other three: traffic, commerce, and housing made possible a plan in which **parks and other recreational facilities are well-integrated** for the convenience, health and welfare of Granite City.

A large recreation center, comprising skating rink, bowling alleys, handball courts,





CIVIC WORKS



RECREATION CENTER

many other indoor and outdoor games, and a restaurant, is centrally located.

A Civic Center was ingeniously designed without sacrificing any of the present civic buildings. A Civic Park was created between Edison and Delmar and Niedringhaus and 21st Streets. Twentieth Street, behind the Post-Office, was closed and this area made part of the park. With the demolition of only a few buildings, a fine park was possible. This not only affords open space and parking space for the convenience of the people of Granite City, but also creates a dignified setting for the buildings about this area, such as the City Hall, Post Office, Y.M.C.A., Library, church, and school.

With the expansion of housing, new schools would be needed, and these have been located near to or within the parks and within easy walking distance of every home.

Access from homes to schools and to shopping centers without any street crossings is provided in most of the new housing areas proposed. Since the welfare of America depends upon good play, recreation, and educational facilities, only the best should be provided. ROBERT LEE FISCHER



FIRE STATION



CIVILIAN AERONAUTICS SCHOO

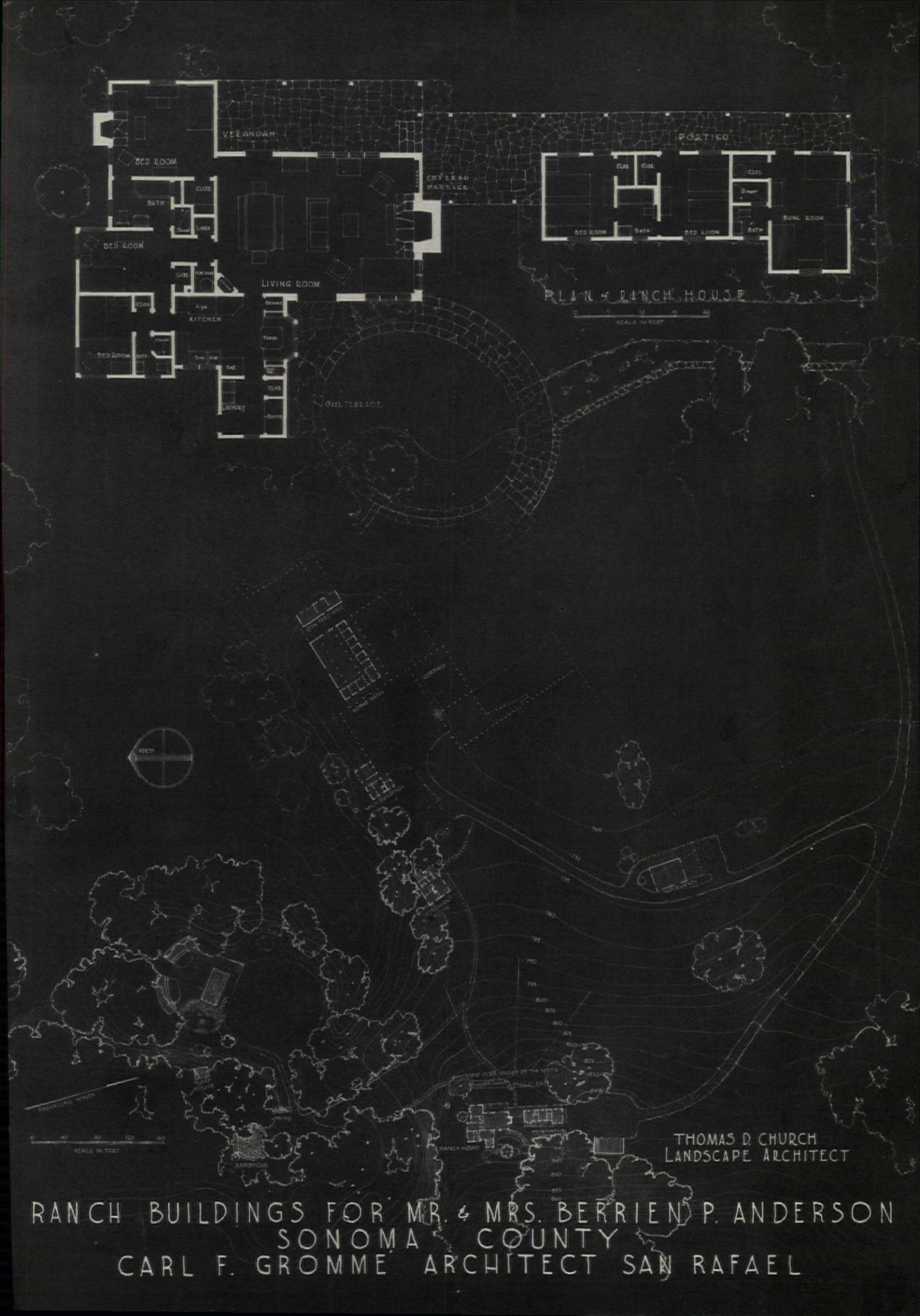
ANDERSON RANCH

CARL F. GROMME, ARCHITECT



LIVING COMFORT is the keynote of the Sonoma County ranch buildings designed for Mr. and Mrs. Berrien P. Anderson by Carl F. Gromme, of San Rafael, California. The view (above) in the Living Room, key unit of the indoor-outdoor living area, indicates the restrained simplicity of structure, finish, and decoration. Furnishings are unpretentious. Walls and ceilings are finished with Douglas fir or sugar pine shiplap, painted white except in the Living Room, which is stained a weathered gray. The wide windows dramatize the view from this superb building site (see photographs on following pages). Outside the Living Room, also serving as a connecting passage to the Guest House is the Paved Porch (photograph below) that gives to this simple home its distinctive character. The porch offers a natural, easy transition to the terrace and lawns adjacent to the house. (Photographs of the ranch buildings were made by Esther Born, of San Francisco)

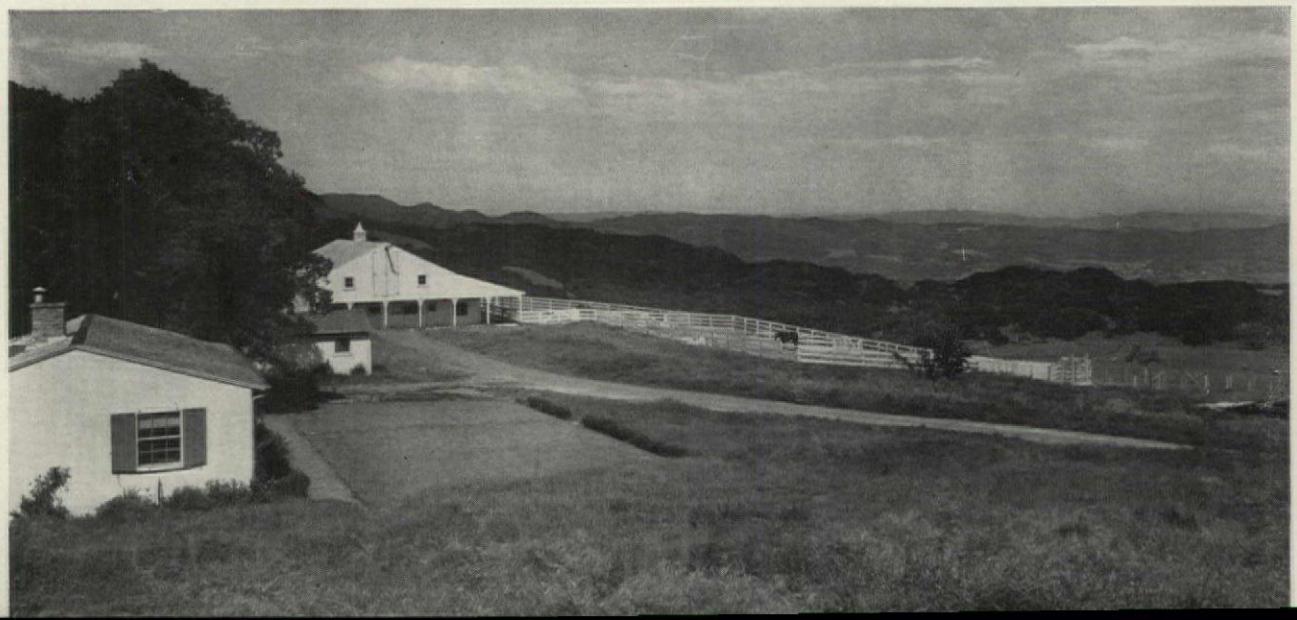




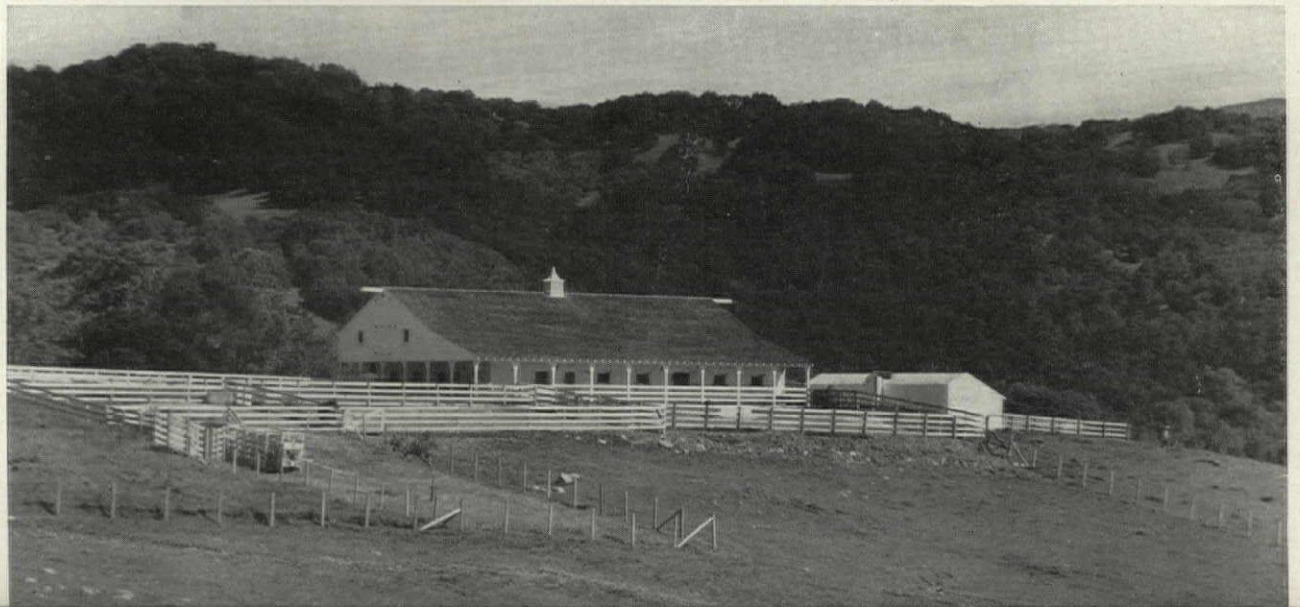
THOMAS D. CHURCH
LANDSCAPE ARCHITECT

RANCH BUILDINGS FOR MR. & MRS. BERRIEN P. ANDERSON
SONOMA COUNTY
CARL F. GROMME ARCHITECT SAN RAFAEL

The Ranch House commands an unbroken view of the Valley Of The Moon (see plot plan over-page) that is well-suggested by the photograph below, looking past the Caretaker's House, Stables, and Corrals



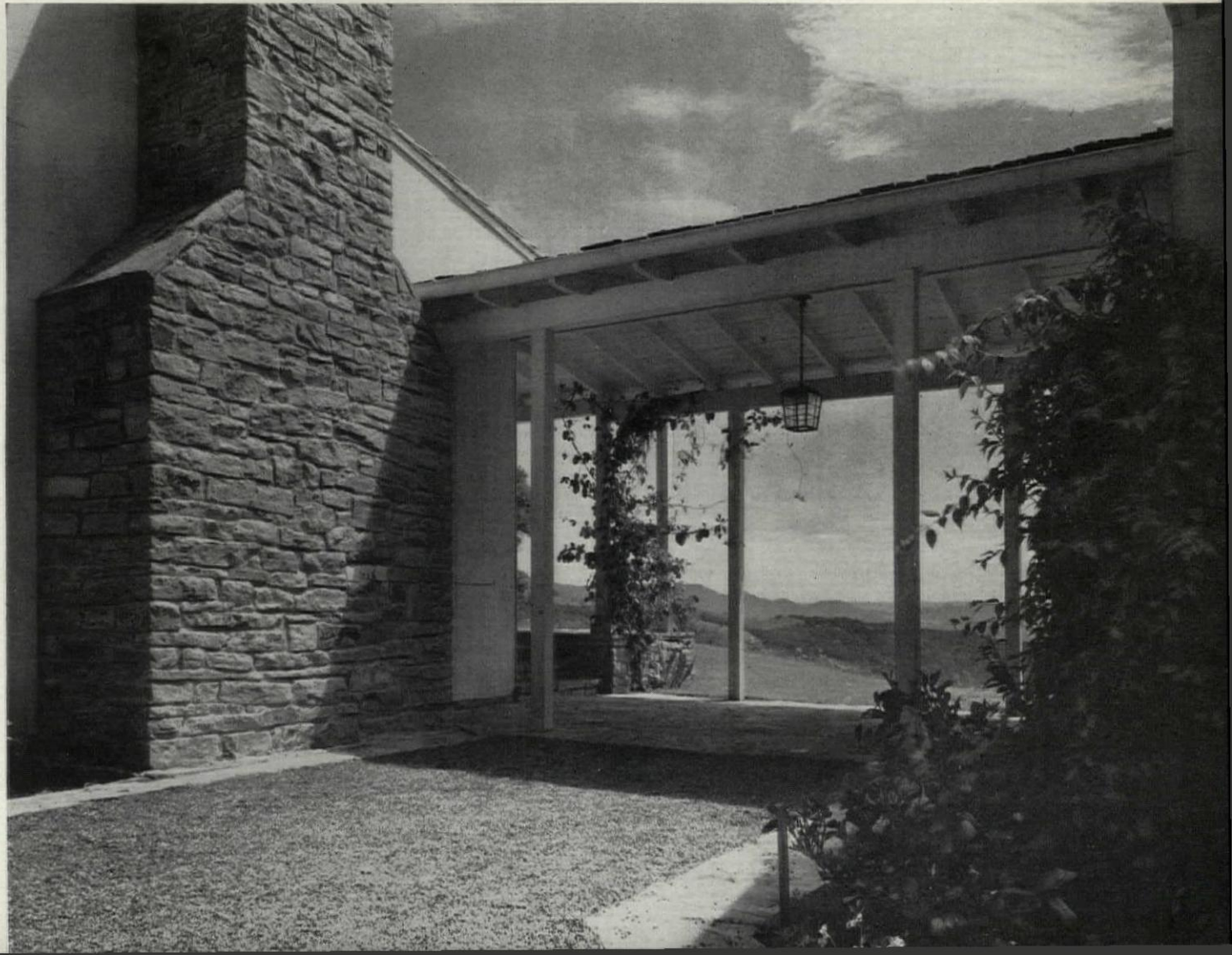
The necessary ranch buildings were thoughtfully-designed by Gromme to compose as a pleasing, unaffected group on the slope below the Ranch House. The Horse Barn and Cow Feed Shed are shown below





In a circle of trees to the north of the Ranch House is the swimming pool designed by Thomas D. Church, with its sun terrace paved with brick and tree sections. The circular steps of the smaller terrace just behind the Ranch House (photo below) are Glen Ellen stone, quarried in the neighborhood. The Ranch House is roofed with "shakes" of red cedar. The stone steps lead down to the paved breeze-way shown in both photographs on facing page, one of the most attractive features

Generous provision was made by the Andersons for extending the traditional hospitality of the California Ranch. Connected to the Ranch House (right, above) with its three bedrooms for the family, is a Guest House (left, above) with two double bedrooms and a larger bunk room, all finished with characteristic simplicity. The view across the Valley Of The Moon seen through the breeze-way (photograph below) dictated the location of the Ranch House on its hillside site. Steps in the sloping lawn are tree sections





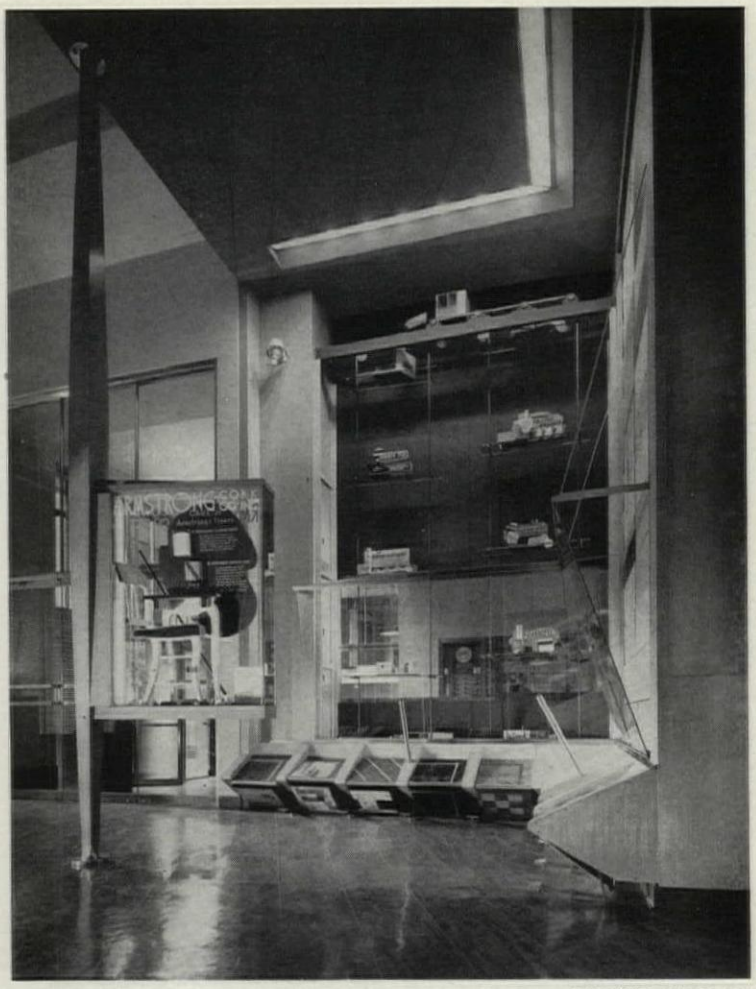
Near the hillside spring is the Barbecue area, also designed by Thomas D. Church, Landscape Architect, of San Francisco. The location is convenient to both Ranch House and Swimming Pool. (See plot plan)

MATERIALS AND EQUIPMENT

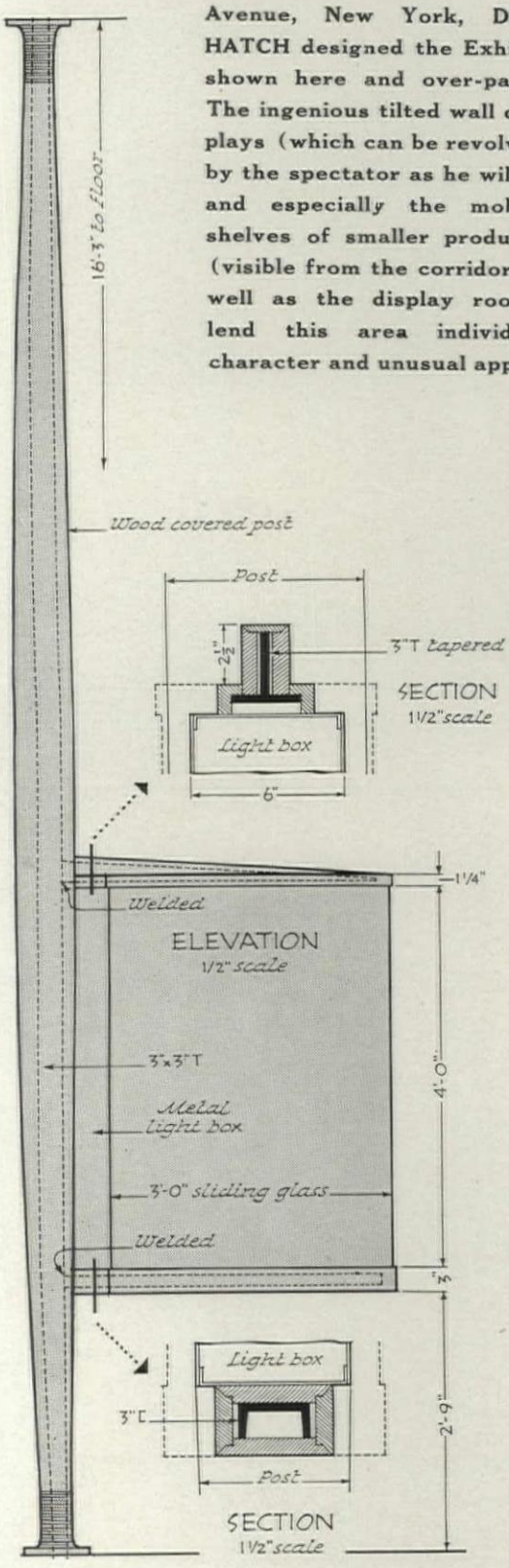
Footings	REINFORCED CONCRETE
Foundation Walls	REINFORCED CONCRETE
Terraces	STONE (quarried close by)
Waterproofing	Integral in concrete floor slabs
Wall Insulation	Loose fill type, 4″ thick
Wall Construction	2″ x 4″, 2″ x 6″, and 2″ x 8″ studs
Floor Construction	CONCRETE SLAB on grade; WOOD FLOOR on redwood sleepers
Roof	Shakes of red cedar
Roof Insulation	Reflective, double
Floor Insulation	Reflective, single
Sheet Metal	Galvanized iron
Windows	WOOD SASH CASEMENT for the most part; Rolltype Screens
Floors (Finished)	OAK, 5/16″ thick T & G fir subfloor (Main House); otherwise, FIR floors, 1″ x 4″ T & G
Interior Walls	DOUGLAS FIR or SUGAR PINE (shiplapped)
Ceilings	DOUGLAS FIR or SUGAR PINE (shiplapped)
Plumbing	Enameled iron fixtures; cast iron drainage; steel pipe (Supply)
Heating	ELECTRIC
Other Equipment	Dishwasher, electric range, electric hot water heaters
Hardware	Hand wrought BLACK IRON
Electric Wiring	Knob and tube and BX. Underground wiring in conduit
Painting	Woodwork painted white throughout except large living room which is stained a weathered gray

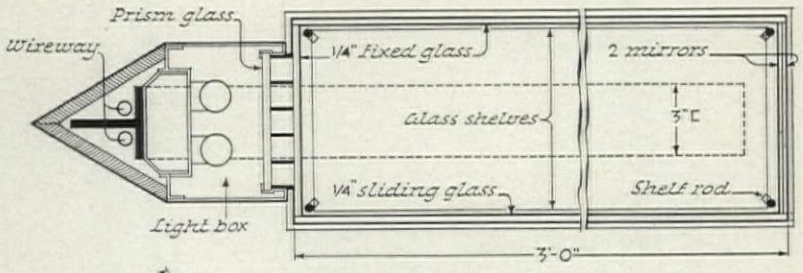
By Don Hatch

For a corner of the Architects Samples Corporation display room at 101 Park Avenue, New York, DON HATCH designed the Exhibit shown here and over-page. The ingenious tilted wall displays (which can be revolved by the spectator as he wills) and especially the mobile shelves of smaller products (visible from the corridor as well as the display room) lend this area individual character and unusual appeal

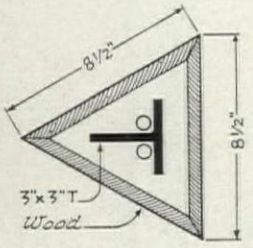


RICHARD GARRISON

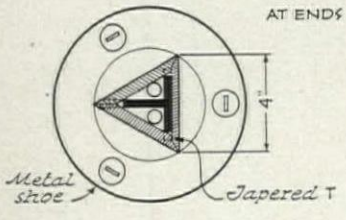


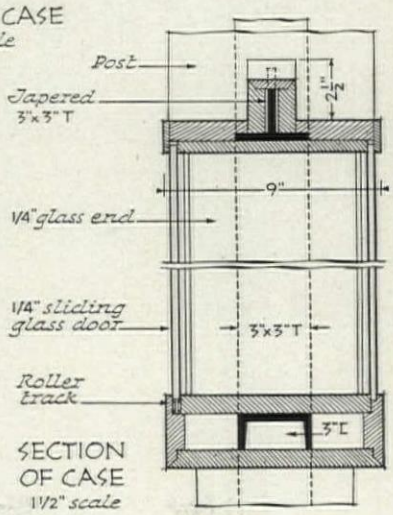


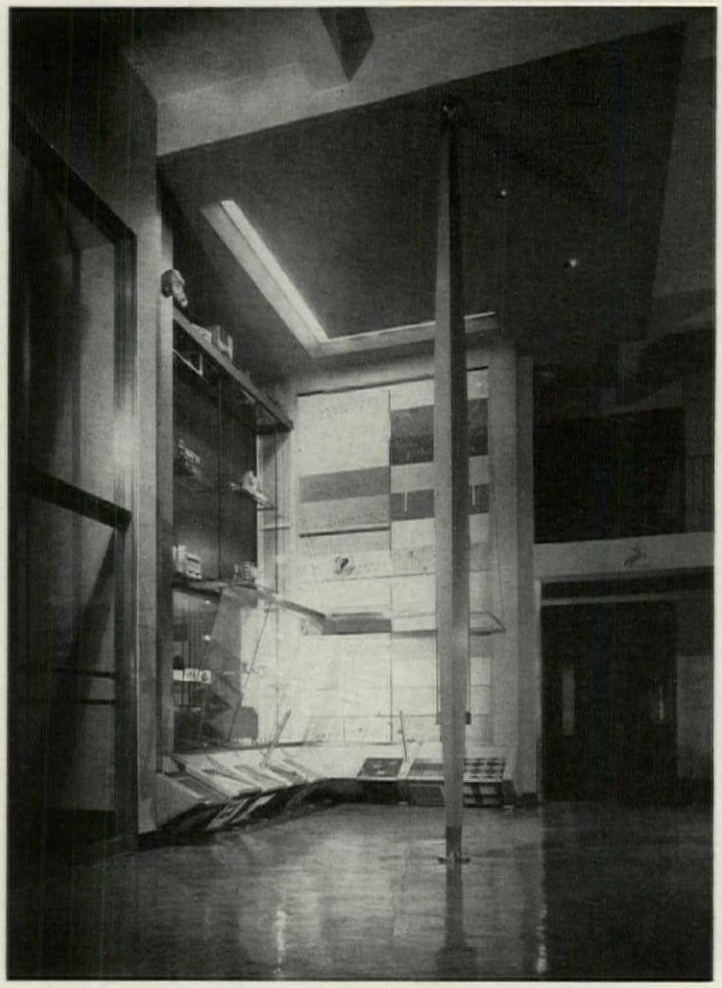
PLAN OF CASE
1½" scale



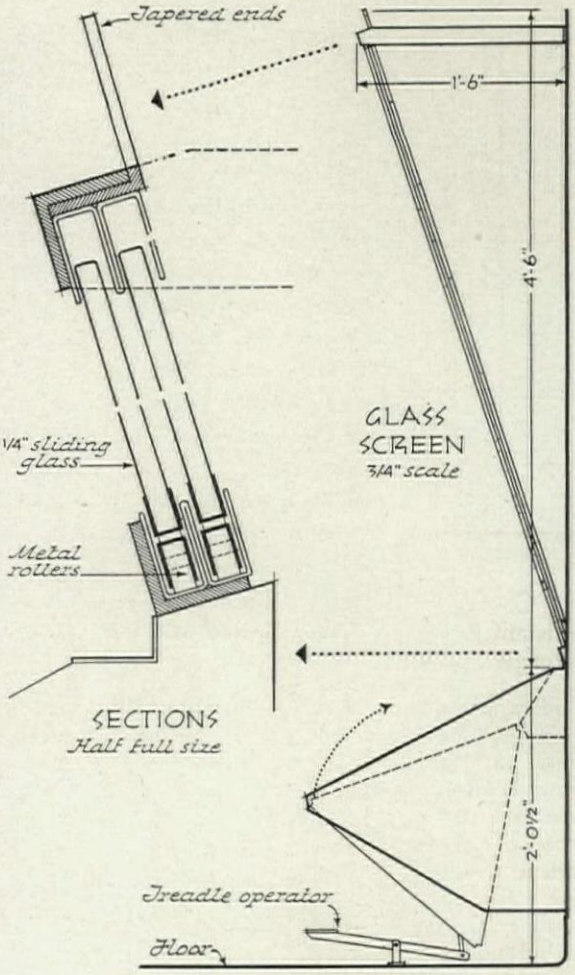
PLAN OF POST 1½" scale



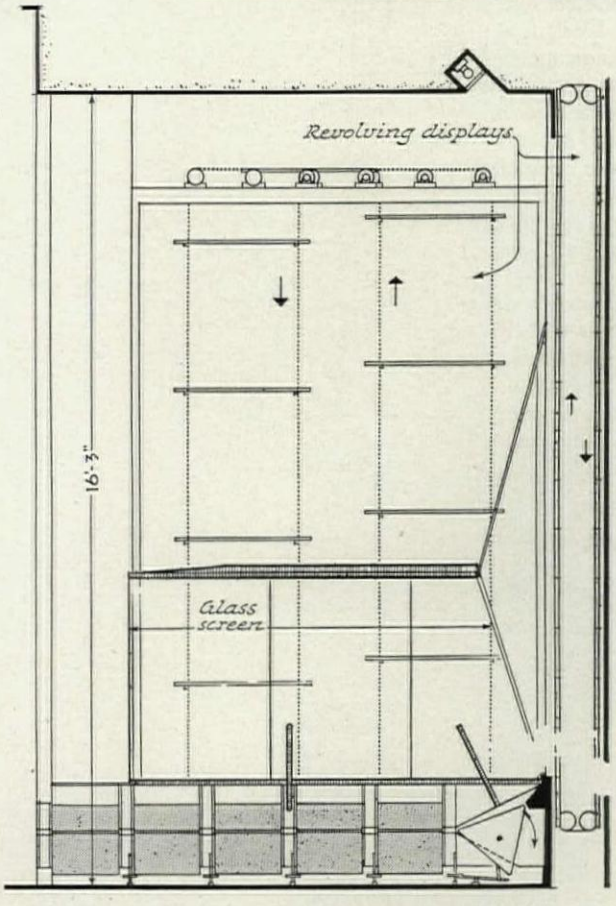


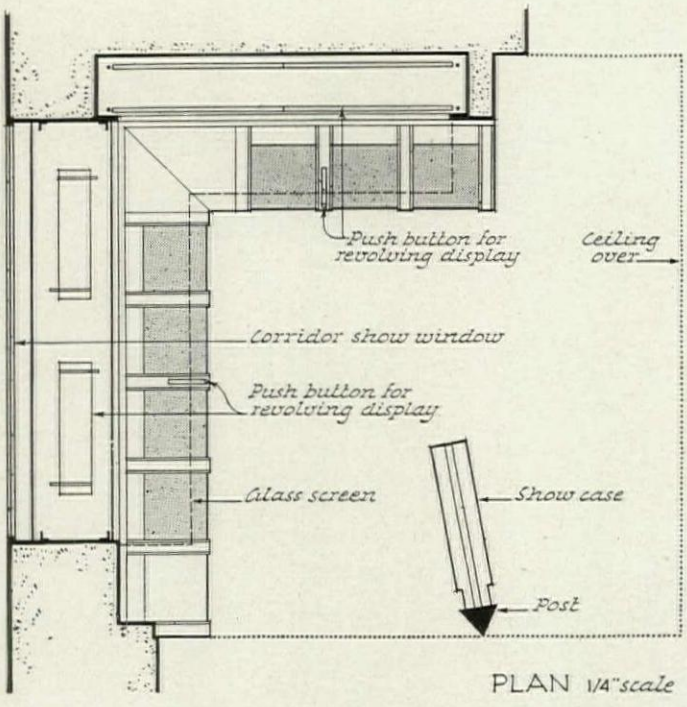


RICHARD GARRISON

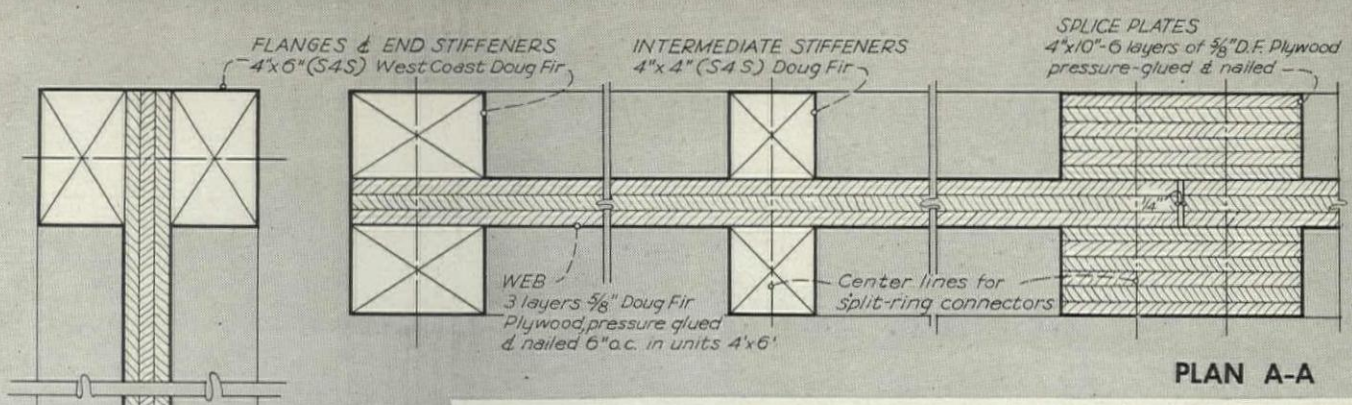


SECTION
1/4" scale





PLAN 1/4" scale



PLYWOOD SATISFACTORY FOR HEAVY-DUTY GIRDERS

by C. W. MUHLENBRUCH
Assistant Professor, Civil Engineering
Carnegie Institute of Technology

Modern methods of fabricating timber structures have led to the use of large wood units designed for moderately heavy loading. In general, these have been restricted to truss construction—although comparatively long span roof girders, designed for light loads, have been used successfully. The present wartime shortage of metals has forced the substitution of wood and plywood for steel and aluminum.

Designers, however, have been handicapped by lack of knowledge of the general properties of plywood, and by a dearth of test results for full-sized sections. Substitute uses of wood have been confined to rather light-duty trusses, girders, and paneling.

Tests recently conducted in the Materials Testing Laboratory of the Carnegie Institute of Technology on an 18 ft. girder designed for highway loads show that this type of construction may be utilized for heavy duty loading. Physical properties of the materials used have also been determined.

The girder was designed for the H-15 live load[1] of the American Association of State Highway Officials and a dead load of 600 lbs. per lineal foot of girder. One-half the H-15 live load was assumed to act on one girder. Also, it was assumed that the web and splices would take shear but no moment. The following design stresses were used:

Shear perpendicular to face plies of plywood	240 psi
Douglas Fir in tension or compression	2000 psi
Load on connector ring in lbs. per ring	1960[2]

Figure 1 gives the construction details of the girder. As shown in this figure the web was constructed of three 6 x 4 ft. sections and spliced at the third points. Each section was made up of three layers of 5/8-in.-thick, 6 x 4 foot Douglas Fir plywood panels, glued together with a water-soluble "waterproof" type of glue under a pressure of 150 lbs. per sq. ft., and nailed 6 in. on centers.

The flanges and end bearing stiffeners were made of 4 x 6 in. (S4S) West Coast Douglas Fir. Intermediate stiffeners of 4 x 4 in. (S4S) Douglas Fir were placed at the midpoint of each panel. Splice plates 4 x 10 in. were made up of six layers of plywood pressure-glued together.

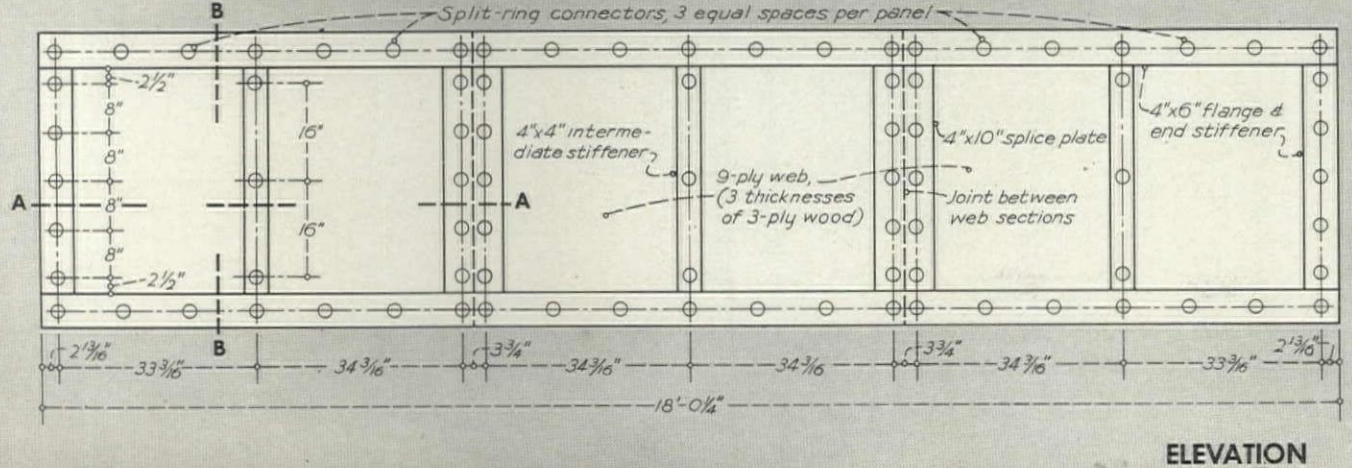
All connections were made with Teco 2½ in. split ring connectors using ½ in. bolts 10 in. long. A minimum edge distance of 2½ in. was used for the connector rings. Each part of the girder was individually laid out, drilled and grooved, and finished to exact length and driven into place. All material was structurally sound and free from defects.

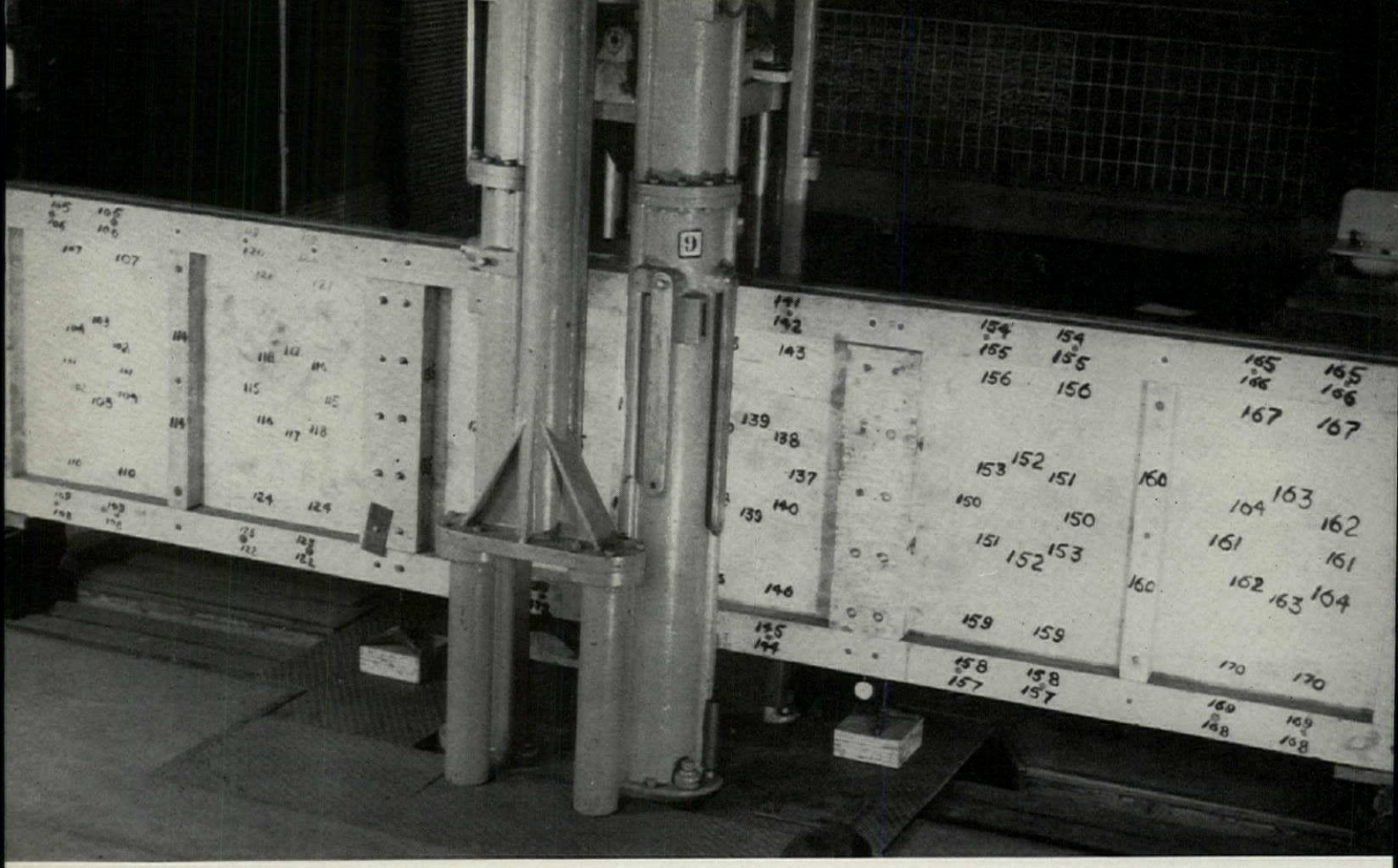
The primary purpose of the tests was to investigate the efficiency of the design by determining the flange stresses, web buckling stresses, stiffener stresses, and transfer of stress from the web to the flanges. This was accomplished by means of 177 gage lines located on both sides of the girder (shown in Figure 5) and a 10 inch Whittemore strain-gage. The gage holes were drilled in surveyor's tacks which had been driven into the

[1] H-15 live load is for truck-train loading; in the condition selected as a design basis, a 15-ton (gross weight) truck produced maximum moment of 12,000 lb. at midspan; to this was added 600 lb. per lin. ft. dead load; total, 12,600 lb.

([2] Although this is the minimum value for load at 90° to grain, it was used due to uncertainty of which ply would govern the ring's action in plywood.)

FIG. 1. Construction of the plywood girder tested at Carnegie Institute (details appear at top of page.) Web was pressure-glued with waterproof glue and nailed on 6-inch centers over its entire surface





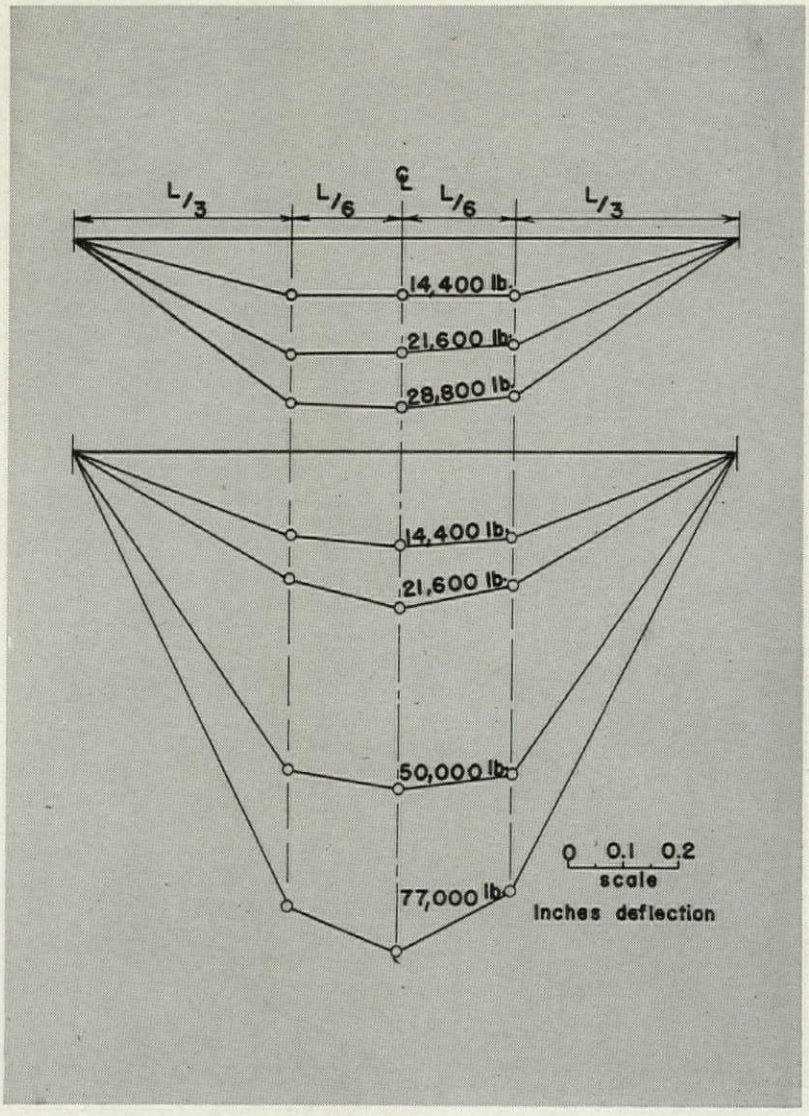


FIG. 3. (Above) Plywood girder in testing machine ready for center-point loading

FIG. 4. (Left) Deflections under third-point loading at top, center-point loading at bottom

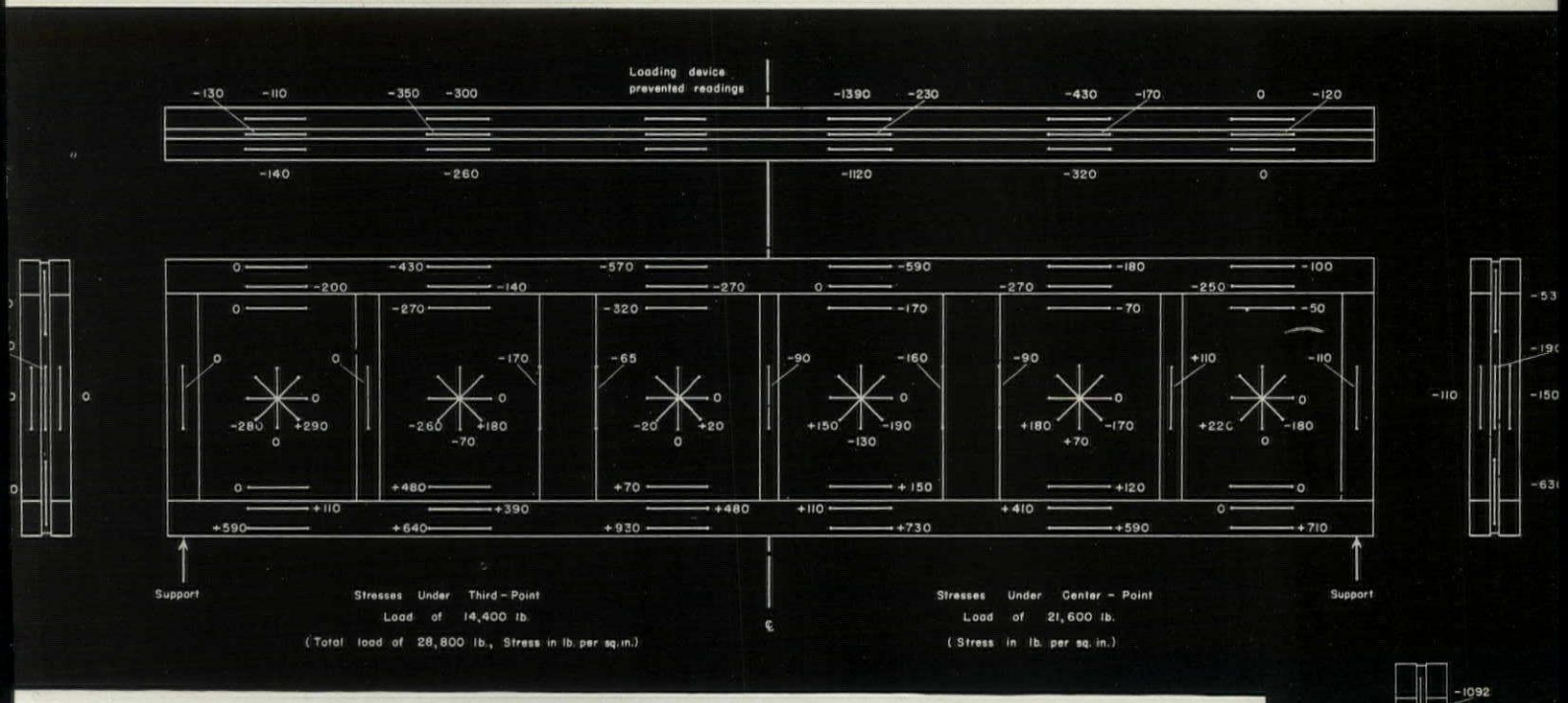
girder at the proper points. To study the results of the strain-gage readings the physical properties given in Table I were determined experimentally.

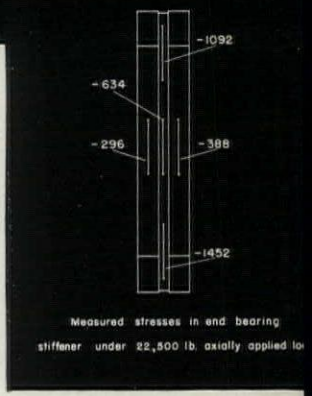
Loads were applied to the end bearing stiffener, the third-points, and the center point, the latter being carried to failure. For the end bearing stiffener test, load was applied through a spherically seated head, 10 inches in diameter, bearing against a ½-in. thick steel plate which covered the top flange immediately over the stiffener.

A length of 8 inches of the lower flange was supported on a similar plate. Shims ¼ in. thick were placed between these plates and the web. Figure 2 shows the results of this test for a load of 22,500 lbs. The strain gage readings indicate that the web took most of the load. The gage lines at the center of the end panel showed no stress except in the vertical direction where a compressive stress of 100 psi was measured.

Figure 3 shows the completed girder as set up in the testing machine. For the third-point loading condition, a total load of 28,800 lbs. was applied at the third-points of the top flange through 1-inch rollers resting on steel plates. Each end of the girder was placed on heavy steel plates set on

FIG. 5. Diagram showing gage lines on which stresses were measured, and stresses recorded at the design load. FIG. 2, below, right, stresses in end stiffener under 22,500 lb. load, axially applied





rocker type supports and no lateral bracing was used. The end bearing area was 75 square inches for each support. Measured deflections for this loading condition are shown in Figure 4. The deflection pattern shows that the splices lack rigidity, permitting the girder to deflect as three separate parts. Thus, the deflection at the center line, which is at the center of the intermediate panel, and the deflections at the third points are approximately the same. Representative measured stresses are shown in a portion of Figure 5. A study of this figure shows that, in general, there is integral action between the component parts of the girder. All of the parts are under-stressed, particularly the splice plates, indicating that they could safely be reduced in size without surpassing design stresses.

For the center-point loading test, load was applied through a steel plate bearing on the top flange and having 150 square inches of bearing area. The same end condition was used as for the third-point test and no lateral bracing was employed. Deflections measured under the center-point loading are shown in Figure 4. Within the design range of 21,600 lbs., the deflection pattern was much the same as that obtained under the third-point loading with slightly more deflection at the center line.

Even with this condition, the girder deflected as three separate units, again indicating lack of rigidity in the splice plates. Stresses measured for the 21,600-lb. center-point load are shown

TABLE I — EXPERIMENTAL VALUES FOR DOUGLAS FIR AND PLYWOOD

Each value represents the average of two specimens, each made of three thicknesses of Douglas Fir plywood and glued in the same way as the girder web.

Material	Modulus of elasticity, psi		Proportional elastic limit, psi	
	Tension	Compression	Tension	Compression
Douglas Fir . . .	2,860,000	2,280,000	5,600	4,300
Plywood* with face grain	1,100,000	1,460,000	1,000	2,300
Plywood perpendicular to face grain	780,000	1,100,000	1,000	1,400
Plywood at 45° to face grain	280,000	225,000	600	850

*All plywood of Douglas Fir

TABLE II — MEASURED AND CORRECTED CENTER-LINE DEFLECTIONS

THIRD-POINT LOADING

Load, pounds	Measured deflection, in.	Corrected deflection, in.
14,400	0.102	0.032
21,600	0.200	0.095
28,800	0.300	0.160

CENTER-POINT LOADING

Load, pounds	Measured deflection, in.	Corrected deflection, in.
14,400	0.172	0.102
21,600	0.280	0.175
50,000	0.600	0.356
77,000	0.891	0.516

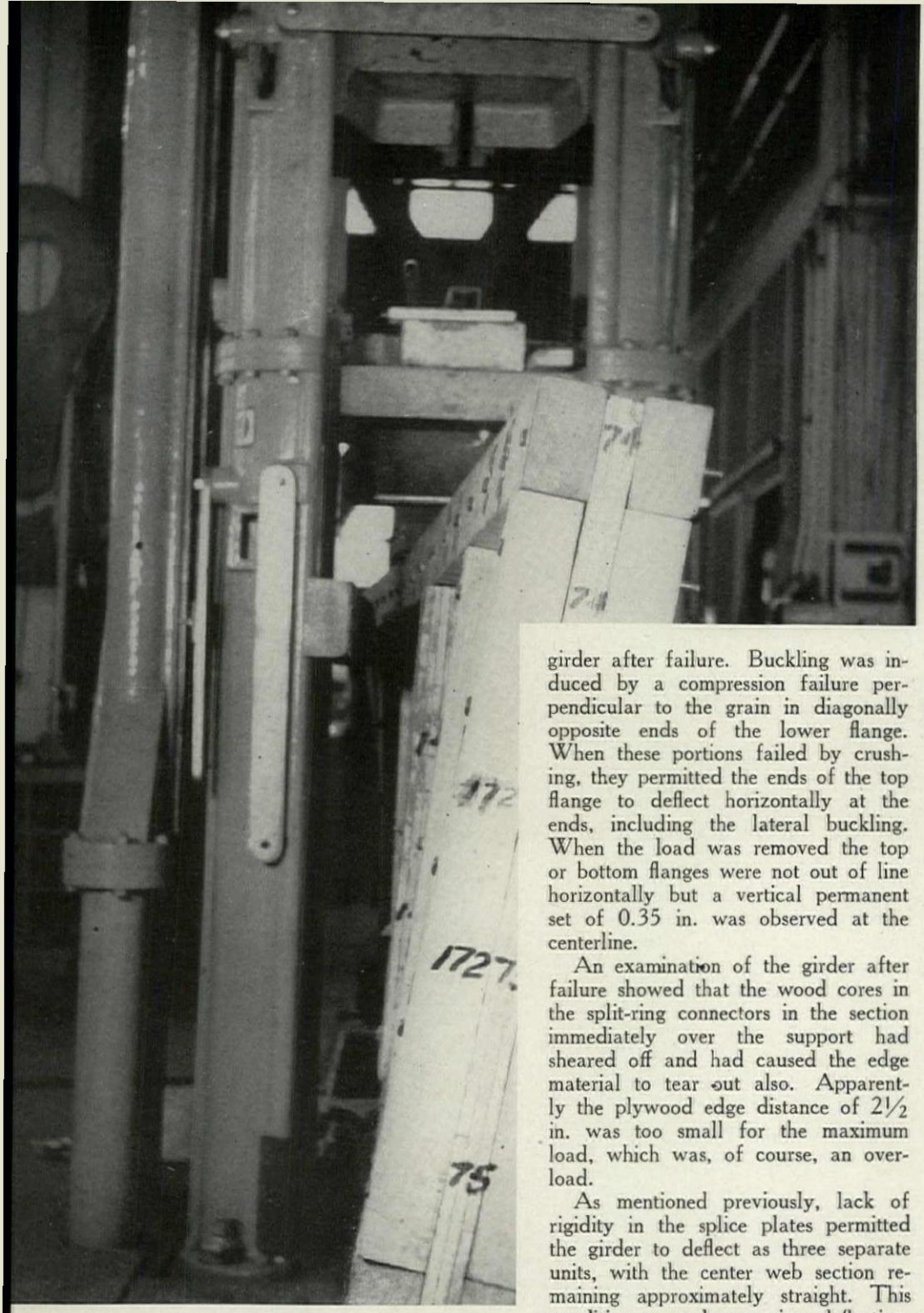


FIG. 6. Plywood girder failed by buckling laterally under a load of 110,580 lb.—many times the design loading

ACKNOWLEDGMENT: The author acknowledges the valuable work of J. T. O'Brien and A. J. Karpinski, former students of Carnegie Tech, who carried out these tests in conjunction with their theses under the author's supervision; also advice from Prof. F. J. Evans in selecting design. The following organizations cooperated: Douglas Fir Plywood Association; Hal Keely Plywood Co. (Pittsburgh); Timber Engineering Co.; West Coast Lumbermen's Association.

in a portion of Figure 5. Again, integral action is apparent although most of the members are understressed. Under a load of 50,000 lbs., a few gage lines were read and a maximum stress of 530 psi was observed at the tensile 45° line in the panel to the right of the center-line. Both the compressive and tensile diagonal stresses in all of the panels were equal to this value for the 50,000 lb. load. The maximum vertical stress in the web immediately over the supports was 1450 lbs.

Under a load of 77,000 lbs. the ¼ inch construction gap between the web sections had closed at the top. The girder failed by lateral buckling at a load of 110,580 lbs. The center-line deflection was 2¾ inches.

Figure 6 is an end view of the girder after failure. Buckling was induced by a compression failure perpendicular to the grain in diagonally opposite ends of the lower flange. When these portions failed by crushing, they permitted the ends of the top flange to deflect horizontally at the ends, including the lateral buckling. When the load was removed the top or bottom flanges were not out of line horizontally but a vertical permanent set of 0.35 in. was observed at the centerline.

An examination of the girder after failure showed that the wood cores in the split-ring connectors in the section immediately over the support had sheared off and had caused the edge material to tear out also. Apparently the plywood edge distance of 2½ in. was too small for the maximum load, which was, of course, an overload.

As mentioned previously, lack of rigidity in the splice plates permitted the girder to deflect as three separate units, with the center web section remaining approximately straight. This condition caused excessive deflection. An improved design could be secured using a continuous rather than a spliced web. Such panels are available and may be obtained in widths of 4 ft. and lengths of 30 ft. or more by some plywood distributors or they may be made up by local lumber mills. The necessary joints should be scarfed and glued in a press, using a resin or glue suitable for the exposure conditions anticipated.

With such a continuous web in mind, correction has been made for the splice rotation. The measured deflections have been corrected to obtain values approximating those which might be encountered using a continuous web. To make this correction, the web sections were assumed to rotate about an imaginary pin at the center of the splice. The ¼-inch movement of the web sections under a load of 77,000 lbs. caused a joint rotation of 0°18′. For this angle of rotation, the deflection caused by lack of rigidity of the splice plates is 0.375 inch.

The deflections at the lower loads were assumed proportional to the 77,000 lb. load and corrected accordingly. Corrected deflections for third and center-point loading are given in Table II. It must be borne in mind that these values are approximate but they help to give an idea of the deflections which might be expected in a similar girder using a continuous web.

If a moment of inertia for the girder cross-section is calculated on the basis of the longitudinal plies alone, of which there are nine, and an average value of 940,000 psi for the modulus of elasticity of plywood is used, the calculated centerline deflection under the 50,000 lb. concentrated load is 0.355. This may be compared with the corrected value of 0.356 given in Table II. This value for modulus of elasticity is the average of the with-grain and cross-grain values given in Table I.

The following general conclusions may be drawn as a result of these tests:

1. The plywood web took moment in proportion to the number of longitudinal plies. A design made on this assumption would reduce the size of the flanges and web and permit a better utilization of the allowable working stresses.
2. Much of the deflection was caused by lack of rigidity in the splice plates. A girder made of a continuous panel might therefore be expected to deflect less.
3. An edge distance of at least 3 in. should be used for 2½ in. split-ring connectors in plywood.
4. Properly designed and constructed girders of plywood may be expected to resist heavy loads with reasonable deflections and satisfactory working stresses.